

Julius Rosenberg ET AL

Referral

National

Aeronautics

And Space

Administration

No.

21

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MR. JAMES WAGGONER

FREE INFORMATION ACT OFFICER

NATIONAL AERONAUTICS & SPACE ADMIN.
WASHINGTON, D.C. 20546

REFERRAL

Reviewed by: SAK / EM

PACKET 21

Subject and File Number

AGENCY NAT'L AERONAUTICS + SPACE ADMIN.

No. of Pages
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LANGLEY FIELD, VA.

AMES AERONAUTICAL LABORATORY
MOFFETT FIELD, CALIF.

LEWIS FLIGHT PROPULSION LABORATORY
2200 BARBERSHOP ROAD, CLEVELAND 11, OHIO

Director
Federal Bureau of Investigation
U. S. Department of Justice
Washington 25, D. C.

BRAFORD
Re Wm Perl (See Enclosure)

Subject: Jack Norman Nielsen
Aeronautical Research Scientist
NACA Ames Aeronautical Laboratory
Moffett Field, California
Security of Government Employees

Banning
Re Wm Perl (See Enclosure)

Dear Sir:

The above-captioned NACA employee was interviewed by the Security Officer of the NACA Ames Aeronautical Laboratory on January 14, 1955, and two photostatic copies of the report thereof are enclosed as of possible interest to the Bureau, particularly in view of the information contained therein concerning William Perl, former NACA employee.

Very truly yours,

Robert L. Bell
Robert L. Bell
Security Officer

116-16013-X

NOT RECORDED
176 APR 6 1955

EXEMPTALS ON ORIGINAL

Enclosures - 2

Memorandum
cc: NY
3-31-55
JPL:SS/BS

ORIGINAL FILED IN 140-5

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HAMPTON FIELD, CALIF.

LEWIS FLIGHT PROPULSION LABORATORY
CLEVELAND AIRPORT, CLEVELAND 11, OHIO

TELEPHONE: EXECUTIVE 3315-3316-3317

May 22, 1950

Federal Bureau of Investigation,
Washington 25, D. C.

Attention: Mr. C. H. Stanley,
Room 4521.

Gentlemen:

The Loyalty Board of the National Advisory Committee for Aeronautics has received the reports of FBI investigation in the case of William Perl (formerly Mutterperl).

In considering this case, the NACA Loyalty Board would like to have before it specific evidence relating to Mr. Perl's marriage. It is reported that he, as William Mutterperl, married Henrietta Savidge in New York City in 1944. The marriage probably took place in August or September, although it may have been earlier that year. It is requested that steps be taken to verify these details.

Sincerely yours,

James J. Kelly, Jr.

James J. Kelly, Jr.,
Chairman, NACA Loyalty Board.

RECORDED - 40

116-100113-36

SEARCHED INDEXED

5

8/9/50
NYC, Cleveland
arranged to submit
loyalty report
for

Julius Rosenberg ET AL.

Referral
National
Aeronautics
And Space
Administration

No. 22

Appeal to: Mr. Miles Waggoner
Section of Information Officer
Natl. Aeronautics & Space Admin.

REFERRAL

Reviewed by: John / Elm

Packet #22

AGENCY National Aeronautics & Space Admin.

Subject and File Number	Serial	Date	Document Description	No. of Pages	Actual Release
Perl (HQ) 65-59312	PART C 939EBF	1/1/52	Lab Worksheet w/ enclosures	2/21	23
Perl (HQ) 65-59312	PART B 939EBF	9/1/50	Lab worksheet w/ enclosures	3/2/50	155

1/7/52
pjr

FEDERAL BUREAU OF INVESTIGATION
UNITED STATES DEPARTMENT OF JUSTICE

Laboratory Work Sheet

Re: WILLIAM PERL, aka.,
Espionage - R
Perjury

File # 65-59312
Lab. # D-141018 BE
D-141633 BE

LAB FILE

Examination requested by: Washington Field 65-5543

Date of reference communication: 11/30/51, 12/12/51 Date received: 11/30/51
12/17/51

Examination requested: Document - Fingerprint

Result of Examination:

Examination by: Dahlgren

No evidence on items 1 through 232, 234 through 240, 242 through 244, 246 through 253 through 255, 257 through 259, 277 through 302, 304; 305, 307 through 330, 334, 336, or items included with Q365 through Q378 that

Specimens submitted for examination
these have been taken apart & reassembled for purpose of photography.

Submitted with Washington Field letter dated 11/30/51:

Q29 - Q364 336 items consisting of NACA reports and other material removed from the office of Dr. Theodore Von Karman at Columbia University in June 1951 by Major Mark P. Maier, Deputy Secretary, Scientific Advisory Board, Office of Chief of Staff, Pentagon. Described as "NACA 1 through 34, 36 and 37 in Col. Order No WFO 11/30/51 CAC (1)."

Submitted with Washington Field letter dated 12/12/51 additional material removed from office of Dr. Von Karman:

Q365 - Q378 14 Project Squid Technical Library Information Confidential reports - Issues 1, 26, 36, 35, 34, 33, 28, 29, 27, 25, 24, 23, 20, 22 and 21.

Brown notebook containing 5 graphs bound with "acco" type fastener.

Although nothing of particular signif. noted regarding following - no concl. reached whether taken apart because of reasons as stated:

Item 241 - holes worn around staple. Staple not tight probably due to small number of sheets held together.

(OUSA)

C

item 256 - fastened with brass fastener. Not possible to determine whether unbent, removed & replaced.

item 276 - holes worn around staple & staple not tight.

item 303 - last page doesn't have staple going all the way through. However, no evidence that another staple was previously used.

item 306 - holes worn around staple & staple not tight.

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30.	MGCRM No. 1609	24 Sep 68	R
31.	MGCRM No. 1612	25 Sep 68	R
32.	MGCRM No. 1622	27 Sep 68	R
33.	MGCRM No. 1702	7 Oct 68	R
34.	MGCRM No. 1712	10 Oct 68	R
35.	MGCRM No. 1800	10 Oct 68	R
36.	MGCRM No. 1703	11 Oct 68	R
37.	MGCRM No. 1805	10 Oct 68	R
38.	MGCRM No. 1806	10 Oct 68	R
39.	MGCRM No. 1700	12 Oct 68	R
40.	MGCRM No. 1802	12 Oct 68	R
41.	MGCRM No. 1822	14 Oct 68	R
42.	MGCRM No. 1840	15 Oct 68	R
43.	MGCRM No. 1812	16 Oct 68	R
44.	MGCRM No. 1817	16 Oct 68	R
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46.	MGCRM No. 1803	17 Oct 68	R
47.	MGCRM No. 1821	18 Oct 68	R
48.	MGCRM No. 1724	20 Oct 68	R
49.	MGCRM No. 1601	20 Oct 68	R
50.	MGCRM No. 1603	21 Oct 68	R
51.	MGCRM No. 1704	22 Oct 68	R
52.	MGCRM No. 1810	23 Oct 68	R
53.	MGCRM No. 1617	23 Oct 68	R
54.	MGCRM No. 1705	25 Oct 68	R
55.	MGCRM No. 1708	27 Oct 68	R

MANUFACTURER

50. MACARONI NO. 101

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51. MACARONI NO. 17009

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52. MACARONI NO. 17232

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83.	MACARIN No. 18028	2 Jul 68	C
84.	MACARIN No. 18033	1 Jul 68	C
85.	MACARIN No. 18027	22 Jul 68	C
86.	MACARIN No. 18031	1 Aug 68	C
87.	MACARIN No. 18028	9 Sep 68	C
88.	MACARIN No. 18036	15 Sep 68	C
89.	MACARIN No. 18031	9 Oct 68	C
90.	MACARIN No. 18033	13 Nov 68	C
91.	MACARIN No. 17703	13 Nov 68	C
92.	MACARIN No. 17701	9 Dec 68	C
93.	MACARIN No. 17820	14 Jan 69	C
94.	MACARIN No. 16010	18 Jan 69	C
95.	MACARIN No. 17701	30 Jan 69	C
96.	MACARIN No. 17223	15 Feb 69	C
97.	MACARIN No. 17619	7 Oct 69	C
98.	MACARIN No. 17142	13 Jan 68	C
99.	MACARIN No. 17007	17 Feb 68	C
100.	MACARIN No. 17521	29 Mar 68	C
101.	MACARIN No. 17522	29 Mar 68	C
102.	MACARIN No. 17520	10 Dec 67	C
103.	MACARIN No. 17530	10 Dec 67	C
104.	MACARIN No. 17503	19 Dec 67	C
105.	MACARIN No. 17524	24 Apr 68	C
106.	MACARIN No. 18038	22 Jul 68	C
107.	MACARIN No. 18039	3 Jul 68	C
108.	MACARIN No. 17711	9 Aug 68	C
109.	MACARIN No. 17716	7 Aug 68	C

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229.	WIC	No. 10-2712
230.	WIC	No. 10-2701

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173.	MACARNO. 1602	10 doc 10	
174.	MACARNO. 1722	12 doc 10	
175.	MACARNO. 1723	12 doc 10	
176.	MACARNO. 1724 from Dr. G. R. Compton from Prof. Robert P. Lee at University of California	10 doc 10	
177.	MACARNO. 1725	10 doc 10	
178.	MACARNO. 1726	10 doc 10	
179.	MACARNO. 1727	10 doc 10	
180.	MACARNO. 1728	10 doc 10	
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187.	MACARNO. 1735	10 doc 10	
188.	MACARNO. 1736	10 doc 10	
189.	MACARNO. 1737	10 doc 10	
190.	MACARNO. 1738	10 doc 10	

TRANSLATION

REF ID: A65100

915. DUGEMEYER CO.

1 Oct 16

163. TECH RPT NO. 2128

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193. TECH RPT NO. 2121

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194. TECH RPT NO. 2107

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195. TECH RPT NO. 2122

21 Dec 16

196. TECH RPT NO. 2102

30 Dec 16

197. TECH RPT NO. 2123

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198. TECH RPT NO. 2101

3 Nov 16

199. TECH RPT NO. 2109

2 Oct 17

200. TECH RPT NO. 2105

19 Dec 17

201. Tech Rpt No. 100-TR-2100-1D

20 May 17

Tech Rpt No. 100-TR-2100-7

20 May 17

202. Translation Rpt No.

3 Jun 17

100-TR-2105-TR

3 Jun 17

203. MW Translation Rpt

3 Jun 17

100-3-TR-702-TR

3 Jun 17

204. Translation Rpt No.

3 Jun 17

100-3-TR-2100-TR

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205. Translation Rpt No. 100-TR-2102-10

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Tech Rpt No. 100-TR-2106-10

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206. Translation Rpt No.

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207. Tech Rpt No. 100-TR-2107-1D

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208. Tech Rpt No. 100-TR-2137-1D

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209. Tech Rpt No. 100-TR-2101-1D

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210. Translation Rpt No.

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211. Tech Rpt No. 100-TR-2102-1D

3 Jun 17

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3 Jun 17

212. Tech Rpt No. 100-TR-2121-1D

3 Dec 16

Tech Rpt No. 100-TR-2121-10

3 Dec 16

213. Tech Rpt No. 100-TR-2126-1D

3 Dec 16

Tech Rpt No. 100-TR-2126-10

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✓ 144. ~~Proposed R&D~~ - 2093-2094
✓ 145. ~~Proposed R&D~~ - 2094-2095
✓ 146. ~~Proposed R&D~~ - 2095-2096
✓ 147. ~~Proposed R&D~~ - 2096-2097
✓ 148. ~~Proposed R&D~~ - 2097-2098
✓ 149. ~~Proposed R&D~~ - 2098-2099
✓ 150. ~~Proposed R&D~~ - 2099-20100

238. *MC* Liner's Notebooks

239. State Program of Economic
Development and Control 1967

Ph. 4 Boeing Ltr B-70-53 16 Oct 67

12-1978-1st Block License
JACA Computer Aerodynamics 1980-80-4B

1250 McClellan Voter List 1973
(subject to NACA Protection)

200. ~~1999~~ 2000-2001 10. 02

1915-1917
1 Dec 67

1940-1948
1948-1952
1952-1956
1956-1960
1960-1964
1964-1968
1968-1972
1972-1976
1976-1980
1980-1984
1984-1988
1988-1992
1992-1996
1996-2000
2000-2004
2004-2008
2008-2012
2012-2016
2016-2020
2020-2024

196 H2O in oil flow
hydrodynamics 30 Oct 17

250-1008 Root of Embryo -
Aero Lab 1-26-68

10. The following table gives the number of hours per week spent by students in various activities.

1990 **1991** **1992** **1993** **1994**

500 Computer Bits 3976

257 BLOOD TEST NO. 1-99-128-ID

68. **WICHITA** 100-1102

THE PIONEER

CLASSIFIED

- | | | |
|------|---|-----|
| 259. | MAC 30 Nov 70 | 103 |
| 260. | MAC 30 Nov 70 | 104 |
| 261. | MAC 30 Nov 70 | 105 |
| 262. | MAC 30 Nov 70 | 106 |
| 263. | Joint MAC List of Completed Evaluations | 107 |
| 264. | Joint MAC List of Completed Evaluations | 108 |
| 265. | Joint MAC List of Completed Evaluations | 109 |
| 266. | MAC Standard Release List
No. 20 | 110 |
| 267. | MAC Standard Release List
No. 21 | 111 |
| 268. | 22 Oct 69, France Voyage | 112 |
| 269. | Prot Gold Bullion No. 2 | 113 |
| 270. | Joint MAC List of Completed Evaluations Supplement No. 61 | 114 |
| 271. | Joint MAC List of Completed Evaluations Supplement No. 1 | 115 |
| 272. | Joint MAC List of Completed Evaluations Supplement No. 2 | 116 |
| 273. | Joint MAC List of Completed Evaluations Supplement No. 3 | 117 |
| 274. | Joint MAC List of Completed Evaluations Supplement No. 4 | 118 |
| 275. | MAC 10 Dec 69 Recd Publics | 119 |
| 276. | MAC 10 Dec 69 Com
Hydrodynamics | 120 |
| 277. | MAC 10 Dec 69 Com
Hydrodynamics | 121 |
| 278. | MAC 10 Dec 69 Com
Hydrodynamics | 122 |
| 279. | MAC Standard Release List
No. 22 | 123 |
| 280. | Squid Abstracts No. 60 | 124 |

280. Solid Abstract No. 200 10 Feb 16 C
281. Solid Abstract No. 201 10 Feb 16 C
282. Solid Abstract No. 202 10 Feb 16 C
283. Solid Abstract No. 203 10 Feb 16 C
284. Solid Abstract No. 204 10 Feb 16 C
285. Solid Abstract No. 205 10 Feb 16 C
286. Solid Abstract No. 206 10 Feb 16 C
287. Solid Abstract No. 207 10 Feb 16 C
288. Solid Abstract No. 208 10 Feb 16 C
289. Solid Abstract No. 209 10 Feb 16 C
290. Solid Abstract No. 210 10 Feb 16 C
291. Solid Abstract No. 211 10 Feb 16 C
292. Solid Abstract No. 212 10 Feb 16 C
293. Solid Abstract No. 213 10 Feb 16 C
294. Solid Abstract No. 214 10 Feb 16 C
295. Solid Abstract No. 215 10 Feb 16 C
296. Solid Abstract No. 216 10 Feb 16 C
297. Solid Abstract No. 217 10 Feb 16 C
298. Solid Abstract No. 218 10 Feb 16 C
299. Solid Abstract No. 219 10 Feb 16 C
300. JICA Tech Note No. 456 10 Feb 16 D
301. Tech Note for later release
JICA Tech Note Annual Index 10 Feb 16 B
302. JICA - Tech Note 10 Feb 17 D
303. JICA - Tech Note 10 Feb 17 D
304. Solid Policy Committee
Minutes 10 Feb 17 D
305. Solid Propulsion Testing
Facilities 10 Feb 17 D

Case No.	Description	Date	Location
300.	Black rock debris	15 Jun 67	W. N. C. G.
301.	Black rock debris	15 Jun 67	W. N. C. G.
302.	Black rock debris	15 Jun 67	W. N. C. G.
303.	Black rock debris	15 Jun 67	W. N. C. G.
304.	Black rock debris	15 Jun 67	W. N. C. G.
305.	Black rock debris	15 Jun 67	W. N. C. G.
306.	Black rock debris	15 Jun 67	W. N. C. G.
307.	Black rock debris	15 Jun 67	W. N. C. G.
308.	Black rock debris	15 Jun 67	W. N. C. G.
309.	Black rock debris	15 Jun 67	W. N. C. G.
310.	Black rock debris	15 Jun 67	W. N. C. G.
311.	Black rock debris	15 Jun 67	W. N. C. G.
312.	Black rock debris	15 Jun 67	W. N. C. G.
313.	Black rock debris	15 Jun 67	W. N. C. G.
314.	Black rock debris	15 Jun 67	W. N. C. G.
315.	Black rock debris	15 Jun 67	W. N. C. G.
316.	Black rock debris	15 Jun 67	W. N. C. G.
317.	Black rock debris	15 Jun 67	W. N. C. G.
318.	Black rock debris	15 Jun 67	W. N. C. G.
319.	Black rock debris	15 Jun 67	W. N. C. G.
320.	Black rock debris	15 Jun 67	W. N. C. G.
321.	Black rock debris	15 Jun 67	W. N. C. G.
322.	Black rock debris	15 Jun 67	W. N. C. G.
323.	Black rock debris	15 Jun 67	W. N. C. G.
324.	Black rock debris	15 Jun 67	W. N. C. G.
325.	Black rock debris	15 Jun 67	W. N. C. G.
326.	Black rock debris	15 Jun 67	W. N. C. G.
327.	Black rock debris	15 Jun 67	W. N. C. G.
328.	Black rock debris	15 Jun 67	W. N. C. G.
329.	Black rock debris	15 Jun 67	W. N. C. G.
330.	Black rock debris	15 Jun 67	W. N. C. G.

302. ~~Demolition~~ ~~of~~ ~~the~~ ~~bridge~~
1222 hrs 28 Dec
London 28 Dec 1962
32. ~~Exploratory~~ ~~drillings~~ ~~for~~ ~~the~~ ~~bridge~~
33. ~~Exploratory~~ ~~drillings~~ ~~for~~ ~~the~~ ~~bridge~~
1221 hrs 28 Dec 1962
34. ~~Demolition~~ ~~of~~ ~~the~~ ~~bridge~~
1220 hrs 28 Dec 1962
35. ~~Reference~~ ~~test~~ ~~on~~ ~~jet~~
~~propulsion~~ ~~(same~~ ~~as~~ ~~abv)~~ 963
36. ~~Flight~~ ~~of~~ ~~15.1813~~ 963

337. *200 ft. above P-22*

1	✓	F	30		R
2	✓	R	31		F
3	✓	F	32	✓	
4	✓	F	33	✓	
5	✓	F	34	✓	F
6	✓	F	35	✓	R
7	✓	F	36	✓	F
8	✓	F	37	✓	K
9	✓	F	38	✓	K
10	✓	F	39	✓	K
11	✓	F	40	✓	F
12	✓	F	41	✓	
13	✓	F	42	✓	
14	✓	F	43	✓	
15	✓	F	44	✓	
16	✓	F	45	✓	
17	✓	F	46	✓	
18	✓	F	47	✓	
19	✓	F	48	✓	
20	✓	F	49	✓	
21	✓	F	50	✓	
22	✓	R	51	✓	
23	✓	F	52	✓	
24	✓	G	53	✓	
25	✓	R	54		
26	✓	R	55		
27	✓	R	56		
28	✓	K	57		
	✓	K	58		

59	✓	F
60	✓	F
61	✓	F
62	✓	-R
63	✓	R
64	✓	R
65	✓	F
66	✓	F
67	✓	F
68	✓	F
69	✓	E
70	✓	F
71	✓	F
72	✓	F
73	✓	F
74	✓	F
75	✓	R
76	✓	F
77	✓	F
78	✓	R
79	✓	R
80	✓	F
81	✓	F
82	✓	R
83	✓	R
84	✓	R
85	✓	R

71	✓	R
72	✓	F
73	✓	F
74	✓	F
75	✓	F
76	✓	F
77	✓	F
78	✓	F
79	✓	F
80	✓	F
81	✓	F
82	✓	F
83	✓	F
84	✓	F
85	✓	F

118	✓ F	147	✓ F
119	✓ F	148	✓ R
120	✓ R	149	✓ F
121	✓ F	150	✓ F
122	✓ F	151	✓ R
123	✓ F	152	✓ R
124	✓ F	153	✓ F
125	✓ F	154	✓ F
126	✓ F	155	✓ F
127	✓ F	156	✓ R
128	✓ F	157	✓ F
129	✓ F	158	✓ F
130	✓ F	159	✓ F
131	✓ F	160	✓ F
132	✓ R	161	✓ F
133	✓ F	162	✓ F
134	✓ F	163	✓ F
135	✓ F	164	✓ F
136	✓ F	165	✓ F
137	✓ F	166	✓ F
138	✓ F	167	✓ F
139	✓ F (one of two found)	168	✓ F
140	✓ F	169	✓ F
141	✓ F	170	✓ F
142	✓ F	171	✓ F
143	✓ R	172	✓ F
144	✓ R	173	✓ R
	✓ F	174	✓ R
	✓ R	175	✓ F

176	✓ F	205	✓ R
177	✓ R	206	✓ n
178	✓ R	207	✓
179	✓ F	208	✓ r
180	✓ f	209	✓ st
181	✓ F	210	✓ R
182	✓ F	211	✓ h
183	✓ F	212	✓ n
184	✓ F	213	✓
185	✓ F	214	✓ R
186	✓ F	215	✓
187	✓ F	216	✓ R
188	✓ F	217	✓
189	✓ F	218	✓ R
190	✓ F	219	✓ R
191	✓ R	220	✓
192	✓ F	221	✓
193	✓ F	222	✓ r
194	✓ F	223	✓
195	✓ F	224	✓ r
196	✓ F	225	✓ F
197	✓ R	226	✓ F
198	✓ R	227	✓ F
199	✓ F	228	✓ F
200	✓ F	229	✓ F
201	✓ F	230	✓ F
202	✓ F	231	✓ F
203	✓ R	232	✓
204	✓ R	233	no count. good enough

234	✓ R	lateral on nose	230	
235	- R	" "	231	
236	✓ F	" "	232	
237	- F	" "	233	
238	- R	" "	234	
239	✓ R	" "	235	
240	✓ F	" "	236	
241	recov'd. longer than		237	spike
242	- R	lateral flagella first few angles & 2nd flagella from a spike w/ a thick base apparently well functional & spikes first removed above	238	
243	- R	lateral on nose	239	
244	✓ R	" "	240	
245	✓ R	lateral on nose	241	
246	✓ R	lateral flagella first	242	
247	✓ F	" "	243	
248	✓ R	lateral flagella first	244	
249	✓ F	" "	245	
250	✓ P	" "	246	
251	✓ K	" "	247	
252	✓ A	" "	248	
253	-	" "	249	
254	- R	" "	250	
255	- A	" "	251	
256	- A	" "	252	
257	✓ A	" "	253	
258	recov'd. longer than		254	

285	✓ P	Wing membrane long & thin, no folds.	
286	✓ R	" "	
287	✓ R	" "	
288	✓ R	" "	
289	✓ R	" "	913
290	✓ R	" "	914
291	✓ R	" "	915
292	✓ R	" "	916
293	✓ R	" "	917
294	✓ R	" "	918
295	✓ R	" "	919
296	✓ R	Wing membrane long & thin, no folds, no veins through thorax, front wings & fore legs normal.	920
297	✓ R	" "	921
298	✓ R	" "	922
299	✓ R	" "	923
300	✓ R	" "	924
301	✓ R	" "	925
302	✓ R	" "	926
303	✓ R	" "	927
304	✓ R	" "	928
305	✓ R	" "	929
306	✓ No wings, abdomen wings integumental	" "	Rpt. Test "not reduced"
307	✓ R	" "	930
308	✓ R	" "	931

as it stands

Get Propulsion Book - as evidence of my post on page removed.

The following submitted with W.F.O. file, 10/12,
Brown book containing 5 graphs - no evidence
having been taken apart.

Detailed Technical Library Information, page 13, page

26

36

35

34

33

28.

29.

27

25

24

23

20

22

21

FEDERAL BUREAU OF INVESTIGATION
UNITED STATES DEPARTMENT OF JUSTICE

RECORDED 9-1-50 ew

Laboratory Work Sheet

Re: WILLIAM PERL, wa.
ESPIONAGE - R

File # 65-59312-36
Lab. # D-120888 BE

LAB FILE

Examination requested by: Cleveland (65-2730)

Date of reference communication: Let 8-21-50

Date Received: 8-23-50

Examination requested: Doc

Result of Examination:

Examination by: DAHIGREN

No ident. tr. Qc12 → Qc20 + Qc22 with tr. on
Qx x Q5 of Horton Sobell case, 10A-2485.

No conc. Hg. Qc6 with KC8 (Kemetta Savidge) because it is not
conclusive since it is in script. Known Hg. by Kemetta Savidge
necessary for further comparison

Specimens submitted for examination

All of the following are photographic enlargements made from 35 mm. film.

- Qc12 An envelope bearing typewritten address "Mr. WILLIAM PERL 570, Lexington Avenue Room 711 New York 22, N.Y. U.S.A." and accompanying typewritten letter dated July 13, 1947, signed "Th. v. Karman."
- Qc13 An envelope bearing handwritten address "Dr. W. PERL Flight Propulsion Lab. of the National Adv. Committee for Aeronautics Cleveland (0)" and accompanying handwritten letter dated August 10, beginning "This letter considers"
- Qc14 An envelope bearing typewritten address "Mr. WILLIAM PERL Box 88, Pupin Laboratory, Columbia University, NEW YORK 27, N.Y. U.S.A." and accompanying typewritten letter dated April 27, 1948, signed "J M BURGERS."
- Qc15 A typewritten letter dated February 4, 1948, beginning "You are really ..." and signed "Th. v. Karman."
- Qc16 An envelope bearing pm December 20, 1949, Brooklyn, N.Y., bearing typewritten address "Mr. WILLIAM PERL 16802 Larchwood Avenue Cleveland 11, Ohio" and accompanying typewritten letter dated December 20, 1949, signed "BEN COOPER."
- Qc17 A "Publications By WILLIAM PERL," typewritten sheet of paper entitled
- Qc18 An envelope pm 2 PM, August 21, 1948, New York, N.Y., bearing typewritten address "Mr. WILLIAM PERL, 1257 Brockley Avenue, Lakewood 7, Ohio," and accompanying typewritten letter dated August 20, 1948, signed "CLYDE E. BROWN."

65-59312-939EBF

Q6 A. SARANT

422 ST N.Y

H. SAVAGE 65 MORTON
NEW YORK NY

Re8 Henrietta Savidge

F.B.I. Sarant OK

- Qc19 An envelope bearing typewritten address "Doctor WILLIAM PERL, Aerodynamic Institute, Cornell University, Ithaka, U.S.A." and accompanying letter dated September 4, 1947, and signed "Dr. R. SAENGER."
- Qc20 An envelope pm 10 PM, December 12, 1949, Cleveland, Ohio, bearing typewritten address "Mr. W. PERL 16802 Larchwood Rd. Cleveland 11, Ohio."
- Qc21 An envelope pm 10 PM, December 22, 1949, Akron, Ohio, bearing handwritten address "Mr. WILLIAM PERL U A C A Flight Propulsion Research Laboratories Cleveland Airport Cleveland, Ohio."
- Qc22 An envelope pm 3 PM, September 7, 1948, Akron, Ohio bearing typewritten address "Mr. WILLIAM PERL 3200 Franklin Blvd. Cleveland 13, Ohio," and accompanying typewritten letter dated September 6, 1948, signed "ILLIAN."

Kc7 ^{sheet of paper containing} Thirty-nine photostatic copies ~~of~~ the known handwriting of WILLIAM PERL.

Kc8 Five photostatic copies ~~of~~ the known handwriting of HENRIETTA SAVIDGE.
^(sheet of paper containing)

Also submitted: Twenty-eight photostatic copies ^{graphin negatives} of envelopes and letters by SAMUEL PERL;

Also submitted: Sixteen ~~envelope~~ photostatic copies ^{graphin negatives} of envelopes and letters from ROBERT BLUM to WILLIAM PERL;

Also submitted: Fifteen photostatic copies ^{graphin negatives} of postal cards, envelopes and letters addressed to WILLIAM PERL; and

Also submitted: Fifteen photostatic copies ^{graphin negatives} of miscellaneous documents.

negatives

negatives

FEDERAL BUREAU OF INVESTIGATION
UNITED STATES DEPARTMENT OF JUSTICE

Laboratory Work Sheet

RECORDED 9-1-50 ev

Re: WILLIAM PERL, wa.
ESPIONAGE - R

File # 65-59312-36
Lab. # D-120888 RE

LAB FILE

Examination requested by: Cleveland (65-2730)

Date of reference communication: Let 8-21-50

Date Received: 8-23-50

Examination requested: Doc

Result of Examination:

Examination by: DAHLGREN

35 mm negs. sent to Mechanical Sec.
Hdg

Specimens submitted for examination

All of the following are photographic copies.

Qcl2 An envelope bearing typewritten address "Mr. WILLIAM PERL 570, Lexington Avenue, Room 711 New York 22, N.Y. U.S.A." and accompanying typewritten letter dated July 13, 1947, signed "Th. v. Karman."

Qcl3 An envelope bearing handwritten address "Dr. W. PERL Flight Propulsion Lab. of the National Adv. Committee for Aeronautics Cleveland (0)" and accompanying handwritten letter dated August 10, beginning "This letter considers"

Qcl4 An envelope bearing typewritten address "Mr. WILLIAM PERL Box 53, Pupin Laboratory, Columbia University, NEW YORK 27, N.Y. U.S.A." and accompanying typewritten letter dated April 27, 1948, signed "J W BURGENS."

Qcl5 A typewritten letter dated February 4, 1948, beginning "You are really .. and signed "Th. v. Karman."

Qcl6 An envelope bearing pm December 20, 1949, Brooklyn, N.Y., bearing typewritten address "Mr. WILLIAM PERL 16802 Larchwood Avenue Cleveland Ohio" and accompanying typewritten letter dated December 20, 1949, signed "REN COOPER."

Qcl7 A "Publications By WILLIAM PERL," typewritten.

Qcl8 An envelope pm 2 PM, August 21, 1948, New York, N.Y., bearing typewritten address "Mr. WILLIAM PERL, 1257 Brockley Avenue, Lakewood 7, Ohio," accompanying typewritten letter dated August 20, 1948, signed "CLYDE BROWN."

- Qc19 An envelope bearing typewritten address "Doctor WILLIAM PERL, Aerodynamics Institute, Cornell University, Ithaca, U.S.A." and accompanying letter dated September 4, 1947, and signed "Dr. R. SAMUELR."
- Qc20 An envelope pm 10 PM, December 12, 1949, Cleveland, Ohio, bearing typewritten address "Mr. W. PERL 16802 Larchwood Rd. Cleveland 11, Ohio."
- Qc21 An envelope pm 10 PM, December 22, 1949, Akron, Ohio, bearing handwritten address "Mr. WILLIAM PERL U A C A Flight Propulsion Research Laboratories Cleveland Airport Cleveland, Ohio."
- Qc22 An envelope pm 3 PM, September 7, 1948, Akron, Ohio bearing typewritten address "Mr. WILLIAM PERL 3200 Franklin Blvd. Cleveland 13, Ohio," and accompanying typewritten letter dated September 6, 1948, signed "LILLIAN."

Kc7 Thirty-nine photostatic copies of the known handwriting of WILLIAM PERL.

Kc8 Five photostatic copies of the known handwriting of HENRIETTA SAVAGE.

Also submitted: Twenty-eight photostatic copies of envelopes and letters by SAMUEL PERL.

Also submitted: Sixteen ~~more~~ photostatic copies of envelopes and letters from ROBERT BLUM to WILLIAM PERL.

Also submitted: Fifteen photostatic copies of postal cards, envelopes and letters addressed to WILLIAM PERL.

Also submitted: Fifteen photostatic copies of miscellaneous documents.
Ritter



Tuesday 1:00
PM

Dear Will -

Please relax - be calm - the reason the Agent wanted a copy of the Statement is, I am positive - just to show his superiors what a good little F.B.I. agent he is - the more of such stuff they have the better - shows how busy and dependable they are to the bigger shots in Washington - I ^{unsigned, just typed my name} sent them a copy ~~on Friday~~ ^{on Friday}. Please

don't worry about this. I have definitely decided not to testify in any event. And remember that much of the reason your investigation has dragged on is that they spent some time checking Vens for divorce statistics, etc., etc. No, I don't intend to get a lawyer - I have nothing more to say & intend to say nothing more. I think it very important that you don't feel they are trying to incriminate you. Remember one can face these events and the people connected with them much better if in a perfectly calm and friendly mood.

This does not mean in ^{when he was here last week} alertness. Mr. Halloran said that his end of the investigation was over now. He probably

sent his material in on Sat or Sun to Washington. My statement can not be misconstrued — and if ever questioned I will not name Ruth McClellan's name as the "person with whom I discussed political & social questions" — There will be no more names or facts discussed by me — This is a solemn promise to both of us.

Now I wish to go thru your letter and show you how your attitude at present is doing you no good — suspicion of them on your part is only going to make them suspicious of you. You say that my testifying as a gov. witness could do you no good & then add — "else why should they ask me" Please Will, remember those F.B.I. men are not told facts of the investigation which are carried on anywhere else in the country — except in such cases as the failure to find a record of the divorce in Reno. They are automations trained to find out matters ~~of~~ this end — They wanted my statement & hoped to get me to promise to testify vaguely to show they can gain the confidence of the

people they interview - after all, like everyone else, they're interested in being promoted, too. I gave them the statement because I feel it shows exactly how I feel on this matter of Communism — I do ~~not~~ intend to testify. I think your mention of collusion is silly — who is conspiring? That is fantastic — Your statement is dated earlier and is notarized — & it got to you too late to send in with your other material. And, if anything, the fact that you haven't sent it in shows how calm you are about this stupid allegation concerning my which is a good state of mind to show.

Please remember that people can not be prosecuted for living together. We considered ourselves married as did everyone else — I shared your bed and board and you were my sole support. If Budenz could live with a woman and have 3 children by her (married her after he joined the C. Church of course) & think our alliance need not be looked down upon. Reasons for our not procuring

President
Eisenhower

then James

license, etc. ~~and~~ are strictly personal,
outside the realm of questioning - something
which is a strictly personal matter solely
between us.

No, I do not think you should
get a lawyer at this stage.

As for the apt - as the only things
belonging to you there were a few scientific
books, it is obvious you weren't living there
— and anyone can understand your wish
for a quiet place to study - & also a wish
to receive your personal mail there in view
of your family's proclivities for going.
And anyone can understand your wanting
a "bachelor" apt.

I met Serant only once - have not
mentioned this to anyone because his name
was never brought up. In a messenger J. Barr
called me up, asked me if the rent transaction
was going along OK - mentioned the Serants were
in NY. - I told him I'd like to meet them &
thank them personally for their trouble (in sending
in a check each month to the LandLord) went with
Dad ~~to~~ & them & thanked them - forgot that J. Barr
was along - in fact I forgot about the whole p-
case & when I was asked where & where I had seen
J. Barr. The whole meeting is as hazy in my mind

that I can only remember the Sarants were staying with friends somewhere in the village. I remember meeting you there & that you were there for the same reason I was - you felt it an opportunity to thank them for the friendly, ~~and~~ realize, that with your basic attitude toward the Communistic form of government in Russia, you have nothing to worry about. You are as loyal an American as any one else. And association with people whose ideas you disagree with cannot incriminate any one. Even Mr. Halloran said that all the things the Communist party stands for are not derogatory to our Capitalistic way of Gov. & he mentioned their staying for a bonus for the A. I. T.

To conclude my letter I would like to say that such investigations as these stick in my craw - as much as in yours. Best getting nervous, worried & cross is bad - Cultivate a detached, humorous attitude & it will carry you through.

~~hope~~ hope your sore throat is better now. I acquired one myself when in the Country last weekend - it was so cold and damp. Write again soon. Yours -- Bette

T. V. Karman
California Hotel
16, rue de Berri
Paris

July 13th 1947

Mr. William Perl

Dear Bill,

We safely arrived in Paris.

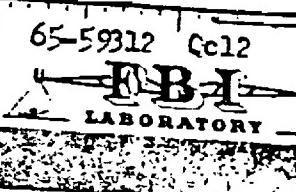
I contacted various French aerodynamists and find they are engaged in the same problems as we are.

I found two fellow who works in conical flows and another man who works on detached shock waves. I think you ought to work on the latter problem. Nobody is yet so far, but sometimes they will get there.

With best regards,

Cordially yours,

The T. V.
T. V. Karman



M. V. KARMAN
California Hotel
16, Berri
Paris, 8e

Par avion

Mr. William Perl
570, Lexington Avenue
Room 711
NEW YORK 22, N.Y.
U.S.A.



DR. THEODORE V. KARMAN

Berwick, August 10
Hotel Carlton.

Dear Bill,

This letter concerns my sister car. At one of
my previous visits I agreed, - really without consulting
her - that you take the car to Cleveland in order
to facilitate your movement from New York to your
new post. The idea was at that time, that we return
to New York in June and you bring back the car
then.

Now, that we stay in Europe till November,
we want to cancel your use of the car. My sister
is very anxious to have the car to her free disposal.
Therefore please be kind enough after receiving this
letter, but certainly before Sept 1. to bring back the
car to the Browns in New Jersey. My sister did
not take the whole deal, especially Mr Beehavis and
you action without asking her directly.

I have now a few days free and intend
to read carefully your specific production. This in
~~will~~ little.

With best regards yours cordially

T. V. Karman

BASQUE

ITZ

12 JUN 1921
BISPYRAME

LA GUTE BASQUE
BIARRITZ
MER-SOON 12 JUN 1921



D. W. Perl

(over)

Flight Propulsion Lab.
of the Material Adv.
Committee for Aeronautics

AIR MAIL

Cleveland (O)

U.S.A.

65-59312 Qc13



DR. THEODORE V. KARMAN

~~Mr. William Perl~~, Hotel Corliss

Mr. William Perl
NACA
Theoretical Analysis Panel
8x6' SWF

5151

LABORATORIUM VOOR
AERO- EN HYDRODYNAMICA
DER
TECHNISCHE HOOGESCHOOL

DELFT, 27th of April 1948.

Nieuwe Laan 78
Telefoon 1310

Mr. William Perl.
Box 88, Pupin Laboratory,
Columbia University,
New York 27, N.Y.

Dear Mr. Perl,

I certainly would be glad if you should come to Delft for doing research work in fluid dynamics. Under the present circumstances this would have to be mainly theoretical (mathematical) work. From your letter I gather that you have been occupied with supersonic problems. Can you indicate somewhat more extensively what you have done ?

Have you done also any experimental work, either on supersonic flow, or on turbulence (with hot wires and amplifiers, etc.) ?

How long do you intend to stay at Delft ? After the summer vacation regular work will start here about October (in September I shall be absent most of the time in connection with scientific congresses).

I suppose that your nationality is U.S. Do you get a grant from your university for coming over to Holland and for living here ? It may be convenient if you would communicate your full name, date and place of birth, and whether you are single or married.

With sincere regards,
yours faithfully,

W. Burgers.

65-59312 Qcl4



DIENST

Departement van Onderwijs
Kunsten en Wetenschappen

Laboratorium voor Aard en Hydrodynamica der
Technische Hogeschool, Delft,
Nieuwe Laan 74.

BY AIRMAIL.



Mr. William Perl.

Box 88, Pupin Laboratory,

Columbia University,

No. 587.

NEW YORK 27, N.Y.

De Hooghees.

D. J. M. Burgers

U.S.A.

65-59312 (c)15
FBI
LABORATORY

Dr. Theodore von Karman
Hotel California
16, rue de Berri
Paris, 8e, France

Feb. 4th 1948

Mr. William Perl
Box 88
Pupin
Columbia University
New York 27, N.Y.

My dear friend:

You are really the man who makes my conscience feel badly. I feel that I let you down somewhat, however, I want you to feel that this happened only because I could not do otherwise.

I hope that you devoted your time to useful studies and if I get back you show me many new things.

Scientifically my stay in Europe did me a lot of good. I had some time to think over many fundamental questions and since I lost some of my interest in supersonic aerodynamics, I spent lots of time studying turbulence.

I am, of course, still interested in the transonic problem. A few days ago I talked with Professor Hadamard who is over 80 and still working on existence theorems of the mixed solution. He showed me an old paper of Harry Bateman in which Bateman poses the question of mixed solution very clearly. I was rather surprised. I have never known of this Professor paper of Harry.

Professor Maurice Roy complained somewhat bitterly that we did not include his name in the bibliography of my lecture on Supersonic Aerodynamics. I believe I gave you this paper so I put all the blame on you, I hope you do not mind.

Now one practical question. I wrote to Lillian Fricker and asked her to make some preliminary work for the preparation of my incometax return. I imagine that my files are in your custody? Please be kind enough to help her. I asked her to either go to New York for a day or to write you to tell you which files she needs for the job. I thank you very much for your cooperation.

My sister send her best wishes and I remain,

Very cordially yours,

Th. V. Karman
Th. V. Karman

TALLER & COOPER

Engineers-Manufacturers

75 FRONT STREET • BROOKLYN 1, N.Y.
TELEPHONE MAIN 7-0000

December 20, 1949

Mr. William Perl
16802 Larchwood Avenue
Cleveland 11, Ohio

Dear Mr. Perl:

I have your letter of December 8th offering your help to the Technion. I think it is very thoughtful and it is very much appreciated by me and all those interested in this work.

At the present time our wind tunnel plans are still in the formative stage, but as soon as technical help is necessary I am sure that your background should be of great value.

With kind personal regards and good wishes for the New Year, I am

Sincerely yours,

TALLER & COOPER INC.

B. Cooper

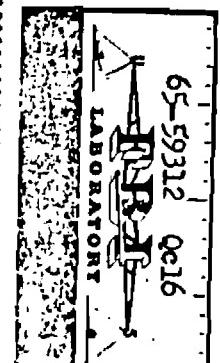
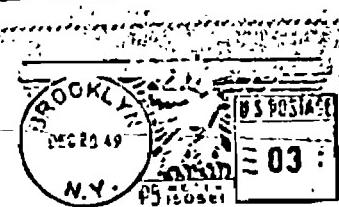
BC:mgh

TALLER COOPER

78 FRONT STREET

BROOKLYN 1, N.Y.

Mr. William Perl
16802 Larchwood Avenue
Cleveland 11, Ohio



65-59312 bcl7



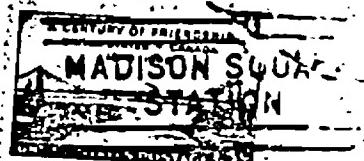
Publications by William Perl
(All classified as Restricted)

1. Katzoff, S. and Perl, W.: The End-Plate Effect of a Horizontal-Tail Surface on a Vertical Tail Surface. NACA TN 797, Feb. 1941.
2. Perl, W.: The Calculation of Span Load Distributions on Swept-Back Wings. NACA TN 834, Dec. 1941.
3. Perl, W.: Axial-Flow Fans and Cooling Power, Part VI of High-Altitude Cooling. NACA ARR L411, Sept. 1944.
4. Perl, W.: The Conformal Transformation of an Airfoil into a Straight Line and its Application to the Inverse Problem of Airfoil Theory. NACA ARR L4K22a, Dec. 1944.
5. Perl, W.: A Solution of the Direct and Inverse Potential Problems for Arbitrary Cascades of Airfoils. NACA ARR L4K22b, Dec. 1944.
6. Perl, W. and Green, L. J.: The Two-Dimensional Incompressible Potential Flow Over Corrugated and Distorted Infinite Surfaces. NACA ARR E3A03, Jan. 1945.
7. Perl, W. and Tucker, M.: A General Representation for Axial-Flow Fans and Turbines. NACA ARR E5E04, May 1945.
8. Perl, W. and Epstein, H. T.: Some Effects of Compressibility on the Flow Through Fans and Turbines. NACA ARR E5C03, July 1945.
9. Perl, W.: On the Minimum Pressure Attainable on an Airfoil in Mixed Subsonic-Supersonic Flow. NACA ARR (to be published).
10. Perl, W. and Moses, H. K.: The Jet Boundary Constriction Correction for Symmetrical Airfoils in a Closed Tunnel: A Solution by Conformal Mapping. NACA ARR (to be published).
11. Perl, W. and Moses, H. K.: The Conformal Mapping of Two-Dimensional Duct Inlets. NACA ARR (to be published).
12. Perl, W.: On the Calculation of Mixed Subsonic-Supersonic Potential Flows. NACA ARR (to be published).

CLYDE E. PHORN,

Fairchild Publications

8 EAST 12th STREET, NEW YORK 3, N. Y.



Mr. William Perl,
1257 Brockley Avenue,
Lakewood 7, Ohio.

Fairchild Publications

7 EAST TWELFTH STREET, NEW YORK 1, N.Y.

TELEPHONE ORCHARD 4-5555

65-59312 Oct 16



MAIL ADDRESS, NEWSMEDIA ONLY.

CLOTHING • DAILY NEWS • DAILY NEWS RECORD • RETAILING HOME FURNISHINGS • MEN'S WEAR • POSTWEAR NEWS • FAIRCHILD BLUE BOOK DIRECTORIES

August 20, 1948.

Mr. William Perl,
1257 Brockley Avenue,
Lakewood 7, Ohio.

Dear Bill:

We have a house on Long Island for the summer, and Mrs. Brown is there most of the time now, so that I received your letter at the house when I returned there last night.

Of course, it is all right to bring the car there again. It is probable Mrs. Brown will be there when you arrive on September 2nd or 3rd, but if not just go right ahead and put it in the garage and leave the keys under the front seat. If you arrive on Thursday afternoon the gardener will be there, and if you arrive Friday, the maid will be there.

You may telephone me here at the office and we can arrange for someone to be there when you arrive, but that is not really necessary.

Best wishes.

Sincerely,

Clyde E. Brown
Clyde E. Brown

CEB:ms



TEL AVIV
ISRAEL
MAY 25 1950

Institut für Technische Physik
der Eidg. Technischen Hochschule
Zürich



Dr.Sg/ai/181

ZURICH 7, September 4th 1947.
Oberholzstrasse 12
Tel. 22000
2200

Doctor William Perl,
Aerodynamic Institute,
Cornell University,
Ithaka, U.S.A.

Dear Doctor:

On the occasion of a meeting in St-Louis (France), my coworker, Mr. E. Roth of Lucerne, and myself were able to discuss windperturbation-problems on trajectory with Professor von Karman. He also considered projectiles under the influence of an oblique air stream and Professor von Karman suggested that I should write to you asking for some more details. He told me that you are very well informed in this field.

I should be greatly obliged to you if you could let me have particulars of the recent publications in U.S.A., especially in connexion with the work at Calif. Institute of Technology.

It might perhaps interest you that I have spent 2 years at The Calif. Institute of Technology, where I became very well acquainted with Professor von Karman.

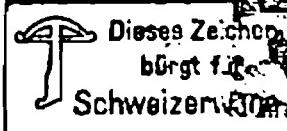
Very sincerely yours

Dr. R. Saenger

65-59312 Oct 19



Amtlich



Eidgenössische
Technische Hochschule

Institut für technische Physik

Zürich
Winterstrasse 60

Doctor William A. RL,
Institute of Physics,
Columbia University,
1512 Amsterdam Avenue,
New York.

Dept of Physics
Columbia Univ.
New York.

65-59322 QC20

LABORATORY

HUGHES-BURNETT, INC.
1950 EAST 105TH STREET
CLEVELAND 6, OHIO

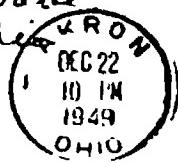


Mrs. W. Perl
15802 Larchwood Rd.
Cleveland 11, Ohio

65-59312 Qc21



Scriber
6910 Butterworth
Akron 20, Ohio



Mr. William Felt
Kappa Flight Preparation
• Research Laboratories
Cleveland Airport
Cleveland, Ohio

Phone River
694 Croatiview
Akron 2, Ohio
September 6, 19

65-59312 Oc22



Dear Bill,

Thanks very much for your letter; it was forwarded to me from Boston.

I have been in Akron since the end of July, because the metabolism ward closed for the summer, and I expect that it will re-open on September 15. For the past three weeks, though, we have been away from home. My family took me along to Canada for a vacation. We had a lot of fun and phenomenal luck with the weather. I'm glad that we missed the awfully hot weather of a week or so ago. We stopped in Toronto for the National Exhibition and in Niagara Falls for a quick trip on the "Maid of the Mist."

All your news about the Boss' movements was a complete surprise to me, because when I talked with Mrs. Schneider she knew nothing about when to expect him or what to do with the mail that was accumulating. Now that you have met Marie you can see that this is the eternal song of each successive secretary, and you have yet to meet the long-suffering one out at Caltech. It's a good thing you have broad shoulders.

I think it would be very nice if, while I am in Akron (which will be for the rest of this week and next week-end, unless I hear otherwise by then) you could drive the "Karmen Plymouth" down to Akron and have dinner with us. You probably know that Mother got home last fall and that we have a home again. Do let me know when you could come. If I find out in the next few days that I will be in Akron longer, I will drop you a card and you would have more choice of time.

I hope you'll be able to arrange it and I'll tell you anything you want to know about our experiments, fiendish and otherwise.

Sincerely,

Lillian

Private
694 Croatiview Ave.
Akron 2, Ohio

P. K. HORN
Sep 7
2 3 194



Mr. William Perl
2000 - 2001 - 2002 -
Cleveland 15, Ohio

+ heel

Robert Blum
79-23 209 St.
Utopia Station N.Y.



Mr. William. Perl
16802 Larchwood Ave.
Cleveland, 11, OHIO.

I went down to the motor vehicle store
yesterday morning and got my learners
permit. I have finally decided to learn
how to drive after all. Advances license may
mean a better job this summer although
I have no plans for the summer as yet.

Are you still practicing the piano
regularly? I am thinking of buying a
^{Guitar} guitar this summer after the term is over.

Mother thinks I'm crazy ^{usual} as ~~as ever~~,
and Father remains non-committal.

Elton is growing up into a fine
young man (^{adult!}) and the little brother
is a regular monster. I do not sleep
late even in the morning, especially on
Sunday after I wake from late Saturday.
^{and a Sunday} Write me about anything of interest
you had and recently regards regards from all,

Bob,

P.S. If type this letter is more readable than
by hand, I am writing it, suspended from ceiling
by my ankles, with my left eye open 70° (the right one is
closed) and with a fine quill welded to my left forefinger.

Dear esteemed Uncle Miller,

I'm sorry I've been late in writing you
this letter. I've got no real excuse other than
laziness. I don't say I am working too hard
because I haven't, really. I divide my
scholastic time almost equally between English
& Math. The Chemistry is a joke. ~~I don't know~~
it's so easy that I know it all but I will
say that what I've learned so far in Chem. ~~I don't~~
I didn't know our high school textbook is very
little. I can't seem to concentrate on the Chem
because it is so boring at this stage of the game and
offers so little challenge.

In Physics we just finished the chapter
on Electromagnetism & Inductance. Very interesting
and fascinating! I had to add to my understanding
mind the units Gauss, Amperes, Ohm, Coulomb
Henry, Weber, and a few others. Seriously, the
stuff on Electricity has been very interesting.

In Math we just finished ^{Calculus} ~~Parametric~~
Equations and Differential. We start
the Chap. on Radius of Curvature today and

③ How are your theories on viruses developing? Have you done anything in the field or read anything that is unusual if nothing else. I am teaching myself determinants and matrices because I am tired of fooling around with 3 or 4 equations in Kirchoff's Law problems. I am slowly progressing.

Aside from the academic, I may start pledging this Friday for a fraternity. I went to a smokers招会 and found the fellows very nice and enjoyable bunch. If I get an invitation to come to the next smoke I will then be installed as a pledge. I am working yesterday!

I learned to play ~~Bridge~~ Bridge last week in the Hiller house on Queens campus. A very interesting game. It has almost all the ~~analogies~~ ^{analogies} of chess and requires a lot more brain than luck which is unusual for most card games.

the 1st one is called the volume. After that comes the beginning of integration.

I attended a lecture on the "Properties of Mesons" by Dr. physio chemists etc. The lecturer, on ~~the~~ Dr. Share told about the pi, mu, tau and 3 other which I forgot the names of. It seems to think that there are only 2 main classes, the others being merely slight variations. On Pg 2 of the May 50 Scientific American, there is some interesting stuff on the experiments being done up at the U. of Rochester. They recorded a spectra photograph of the largest nuclear explosion ever recorded. They named it "Rader star." Also some ~~collected~~ condensed theory by Fermi, Yang and Yukawa called from the "Physical Review" an excellent general discussion of the Hydrogen bomb by Prof N. Ridenour on Pg 11. Buy the magazine if you haven't. I am sure you'll enjoy this issue.

Dear Wallington 2

~~you not approach gift (also!)~~

I am now continuing a 6 " telescope
mirror. I am right in the middle
of the grinding. I have fully
recovered in both mind and body
from my recent accident. I have
decided to go to City College
(if they will take me) and study
Mechanical Engineering. I graduate
next June and am now starting my
7th term.

Good luck or you P.H.O. wins
etc. *(Turn over)* *you're truly,*
Robert & Glenn

Sept 5, 1948

Dear Uncle Will,

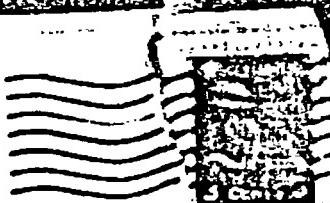
Thank you very much for
your lovely, beautiful, and ever
so interesting and educational cat
encyclopedia. I am getting six other
books on nature which I will
especially enjoy. They have
to be shipped from Chicago.
We already have the encyclo-
pedias and dictionaries. They
are very beautiful.

I expect to be the smartest girl in the class, as a result of your wonderful gift.

P. S. Contrary to popular ^{belief}
opinion ~~you don't cross~~
(well) the damage from ~~crossing~~
is ~~not~~ ~~so~~ ~~bad~~ ~~as~~ ~~you~~ ~~think~~
just "do ~~it~~ ~~right~~" ~~and~~ ~~you~~ ~~will~~
find it is ~~impossible~~? ~~to~~ ~~win~~
~~such~~ ~~and~~ ~~a~~ ~~good~~ ~~game~~ ~~if~~ ~~you~~
don't ~~know~~ ~~the~~ ~~rules~~ ~~and~~ ~~the~~
rules ~~of~~ ~~the~~ ~~game~~ ~~you~~ ~~are~~ ~~playing~~
about P. ~~you~~ ~~will~~ ~~lose~~ ~~all~~ ~~the~~
time ~~you~~ ~~play~~ ~~it~~ ~~wrong~~ ~~and~~ ~~you~~
will ~~lose~~ ~~all~~ ~~the~~ ~~time~~
with O.H.I. ~~you~~ ~~will~~ ~~lose~~ ~~all~~ ~~the~~
time ~~you~~ ~~play~~ ~~it~~ ~~wrong~~ ~~and~~ ~~you~~
will ~~lose~~ ~~all~~ ~~the~~ ~~time~~

(150 feet)

Karen Blum
79-13 309 St. Blvd.
Elmhurst, N.Y.



Mr. Johnson
1680 - 1/2 - 1/2
P.O. Box 11

Robert Bruno

7.9-3.2-0.9-3.7

April 14, 1987

Dear Eddie,

As I sit here in school during lunch period, I gaze around at the neighborhood thinking about what free time I have. I shall calculate. Knowing someone like my friend Eddie, we're going to be doing these & shall will be a good choice of studying and such.

These last two months have been very busy indeed. At 1:40pm, trying to get into college and whatnot. I give you also a chronological timeline of my road to success, the last which has'nt' started.

- ① Friday 24 to Sunday 1; I took a 10 day camping and hiking trip - George Harrison State Park sleeping in different shelters and outdoors. No open house. watershed. May 1.
- ② May 2-3 - Took N.Y. id Report to Home in preparation & 10 hrs total of all types of tests. Don't know results.
- ③ May 11-12 - Took City College Entomos exams for expenses 3.5 ~~day~~ hrs each night. Very tiring. Will find out if down accepted there June 27.
- ④ May ~~26~~ - May 31 - Took a 5-day trip to the Catskills started hiking from Phoenicia and hiked Wittenberg, Cornell and Middle Mt. (4 to 4, High in Catskills). wonderful trip!

- (8) Incidentally I took College board tests for Cooper Union April 9 -
- (9) On June 2 - I received a form letter of rejection from Cooper Union. I felt pretty lousy because now I didn't know how I stood as far as college went. (Cooper rejected me or so was about high enough score on College Board)
- (10) On June 4 - Happy day! Received a letter of acceptance from Emory College accepting me outright with no financial expense first on my arrangements. (Average being \$10,897). Feit great!
- (11) June 8-10 - Took placement exams at Bureau for Work and Vocational and Secondary High. Didn't accept.
- (12) June 14 - Writing this letter to you, future;
1. June 17 - Last day of vacation
2. June 20 - First night.
3. June 21 - Big exams.
4. June 22 - 1. twice this...
5. June 23 - Big exams.
6. June 24 - Graduation at all things. Received diploma on June 28. Will go to City College during fall term & will out-hire on 1st of Oct. with whom Cornell ... has been working recently and I am very happy about it. over ~~any~~ any other institution. This one is going to be the place. To go to page 2 and won't be crowded.

(THE PEN STINKS)

~~Also got some paper, I can go right on getting our stationery.~~
~~Maybe soon.~~

This is page 2 (Nothing else)

Now as far as college with the blonde being my
plan. I shall go to Queens College for 2 years and
the first engineering. Then I will go to City College for
my final 2 years. Since we are closer they will be
2 yrs and if we get good marks, then I
would fit it all possible into 2 years. At least
Washington, New York, 2 hrs. of the ride. (Good train).
Ok closing for now. I will update again in my plan.

II. PRE ENGINEERING CURRICULUM

Under an agreement made between the School of Technology of City College and Queens College residents of Queens who wish to matriculate for a degree in technology may complete the required studies in the liberal arts and sciences at Queens College during a two year period. Students who complete this work with an average grade of 75% are assured that they will be accepted for admission to the desired engineering course at City College precisely the same basis as those students who take preliminary work at City College. Applications for these courses should be made directly to Queens College.

Good luck, Now!

My course will be mechanical engineering, so far as I
know now. I feel a civil engineer is more suitable
as you's great. I'm studying now & taught back
in part time in a technical school. (At home) but
will be called with the first year field methods
I think. Good luck. This summer.

1. Planes & boats.

2. I studied courses which went with him.)

3. Will go to City Engineering. (On 11-1st.)

4. Last but not least of Co-Colleges. Although I have
enjoyed myself & college work, and really deserved
to sit out the nonsense and do some real work.

to for college as far as the summer goes? Well
I stay in the city as usual. I took a few prospects
and lined up for a job. One is a television writer and
the straight (very slim possibility) news counselor. This
television job looks good. It means working on in town
at the day classic work with in him. I am fully
furnished. Our used a schmuck. Here and there
books on television theory. I took her teaching
myself radio theory and calls. I will be getting
dressed this summer. I.E. my stand up. I'll start
out gradually. I look forward to you call up
(13 W. P.M.). If it was - stay tuned.

How's home? You fine coming along?
Also when do you expect to start for the P.H.D.
Or are you going to wait up in Cleveland Blue
with a wife soon. It may be strange information
Regards from all, Steve, we just 3 yrs old,
Pardon my handwriting. It
is normal as it is sloppy, unreliable

from unaccustomed neglect,
Early,

P.S. Cornell University is down at Grand Central Station
Dear G., Take a big kick out of it.

P.S.S. As you may surmise from my letter I am an avid no
advertising fan. I do get a place. place under
down by in mid woods. And I get out but feel very
good. It's like a change from the jingly-aflects very
melancholic mind.

Robert Blum
79-23 209 St.
Astoria 16th N.Y.



William Perl
16803 Larchwood Ave
Cleveland, 16 Ohio.

Jan. 11, 1949

7923 209 St.

Utopia Station N.Y.

Dear Will,

I am writing this letter after just completing my homework. It is 11:30 P.M. These last few weeks since the Christmas Vacation, I have been piled high with work. For as about this I shall take my Advanced Algebra regt., I am studying hard because I would like to get 90 or higher. We started the Calculus this other day. Stuff like this; first type few basic formulas: ① $y = c$ and $y = x^n$ and $y = t$

$$\text{② } \frac{dy}{dx} = 0 \quad \frac{dy}{dx} = nx^{n-1} \quad \frac{dy}{dx} = 1$$
$$\frac{dy}{dx} = nt \quad \frac{dy}{dx} = ax^n \quad \frac{dy}{dx} = nax^{n-1}$$

\ seen familiar.

We just started finding maximum & minimum pts. on a graph. Very interesting! Regarding your request on my magic hobby, I am as interested aviation being fun. I branched out with billiard ball sleight, Hanoi Mult. and dimension balls etc. I recently applied for Cooper Univ. They acknowledged my application and sent me a application for my 7 hrs of work. On Apr. 9. 1949 to take the College Board Test. The combination of Test and ~~average~~ average decide my being admitted. Around March I shall also apply for City College. If accepted by either one I'll go to college in Sept. If not, I don't decided what my plans are. I do want to go

to college, however, I wrote down Mech Engineering on the application for desired course but this is ~~just~~ ~~not~~ definite. I send that you are taking piano lessons. Enjoy yourself and inform me of your progress. I finally completed ~~homework~~ whizzer and returned it to him. It works! I got my major letter in Bible today. Now I am a member of Corp varsity. It's great an honor to be awarded a major letter in my school so I am firstly proud. I am planning to hitchhike to California this summer about Aug. for a month. My friend invited me to accompany him. His parents and uncles there who would welcome us. I would like to work all of July and accumulate some cash, and then have a month of hitchhiking - necessities. This is only in the thinking stage and is not definite. It would be fun, though. Bible letter is about the same. Family relatives, I mean I have adopted a new policy. After an argumentative state, I leave the room. I spare myself a lot of aggravation that way. I am smoking a pipe now. I don't do it to be a big shot but because I enjoy it. I rarely smoke outside but when I do my homework at night, I relax and smoke.

Well, I am tired now. The clock says 10.40 A.M. and I have school tomorrow. Please excuse the sloppiness of the letter and my handwriting. I didn't proof read it, so I am striking it into a envelope now.

Yours,
Bobby

Elect. Blaw
79-23 208 87.
Algon Blaw N.Y.



Mr. William Perl
16802 Larchwood Ave.
Cleveland 11, Ohio

~~PR 150~~
Feb. 21, 1950

Dear Will: B.E.E.; M.E.E.; P.M.D.; F.N.P.; B.V.O.

The first three sets of initials are general academic stuff. The F.N.P. with the question mark ~~stand~~ afterward stands for nuclear physicist. The B.V.O. is some crap pertaining to ~~underwear~~, I happened to think of.

I didn't answer your last letter immediately because I hadn't received my marks (first one) from college. I received them yesterday and they are as follows: English "C"; Maths "C"; Physics "C"; Philosophy "C"; Hygiene "C"; no "B's" or "D's" or "A's" for that matter. I have a straight "C" average now. Consistent, eh not! Seriously, I'm a bit annoyed at myself and at my laziness. I could have had a "B" in Maths and Physics but the birds caused me both good.

① He asked Grandpa to forward his
airline ticket receipt from the Congress
so he could be reimbursed. Received and the order
is in Boston.

② H.A. asked for an 8-page booklet
and also why she doesn't come to
Europe and visit her sister.

Write about all I remember as regards
Lorraine's letter.

I registered for the new term
today. I have 24 class hours and a
long program. I start around 10 and
finish from 4 to 6 every day.

No lunch break or Thursday, either.
But the program is the best I could do
under the existing circumstances.

Write me about your new job
and what you are doing. Please only
unclassified information. I'll write
soon as I have some more information.

P.S. What about the

Best of health,
Bill

③ I am slowly finding out how important type
is in college. My costs anywhere
from 25% to 50% of the total price. However,
next term I will really try for "A" and "B"
in technical courses. Enough of my
topic.

Mother and Father are in Florida on
a 9 week vacation. They drove down on Friday
and are expected back on Feb 14. The baby
is at Grandma and Cleon and I are
staying home alone. We eat, sleep, and ~~play~~
live as ~~usual~~ usual, the only difference
being the house is marvelously quiet. Your
sister can be a very earth shattering
thing, she wants to. (which is all the
time, it seems.)

Regarding Lorraine, I sent the following
information to Grandma which she is
asking me to enlighten you about. (With
a lazier version.)

7/19/50

Calling Card

Jack Davidson

Contractor

11 Battery Place
New York

Merritt-Chapman & Scott Corporation

Plasterer - Drywall - Painted ceiling ad-

Dr. Freedman 1511 Avenue

570 Madison Avenue, Room 701

New York 2-4211-74

326 Avenue Name

Gramercy Park

7/19/50

Reviews of Modern Physics

Volume 21 April 1949

18 July 1946

22 April 1950

The Physical Review

Volume 77 2/15/53 \$ 4.00

" " 2/1/50 \$ 5

Volume 77 3/15/50 \$ 5

" 78 1/1/50 \$ 5

Books

International Encyclopedia
of Physics
(one volume) George Ladd
W.W. Norton

Journal of Polar Exploration
Macmillan

Geological magazine also

TALLER + COOPER ENGRS MA
25 EAST 23rd ST BROOKLYN N.Y. 4-2550

(Class)

Mice. Article at bottom hanging in class
(July 21, 1912) Sealed but not taken.

- 1) Purplelet ♀ - Nestling p. Pale orange
- 2) Greenlet ♂. P. (Glossy) -
52 - Greenlet ♂. P. (Glossy)
- 3) Carol. named "TN-1912" - Nest
of "Nightingale" Orange etc. 11
- 4) Chestnut (nest broken)
set anti. Chicks (nest broken)
- 5) Heavy orange (nest broken but intact)
- 6) P. (Horned) - Orange - nest broken

✓
Closet

15000

Set of papers ^(13 pages) diff on variations, approximations, & Calculations

area deeper (not to be)

nitrolate. " "

greenish-blue colour (white).

0 day for radio (and 100%)

base W/ numerous white, l. l. st.
(searched but found none.)

Buckler - (most Taken) Escaribidae

All Begin at the same place.

61. Saint Lucia

(3) *Types* in other contexts.

(A) Biogeography of the first

(3) anti-parallel of the two
helices.

⑥) *stratigraphic*

Al Razzak, who is the author of *Sabiq*,

"Property of Peleg M. Packard"

81 marine plants which

B) Campylobacter spp. und *Clostridium*
nach einer Verdauung (fast zuverl.)

18th Mississippi "Play it safe" Fair & Square

6 Vol. of *Philippine Painter* - Vol. 72, 1947, (Volume)
Vol. 75, 1949; Vol. 77, 78, 79, 1950.

Claes

- (1) "Powers of attorney" copy/pins de Koenen to
T. Edward Peacock, 6/13/46, Tidlo &
Trust Co., San Antonio, Texas
(not taken).
- (1) ~~2~~ "Sugars etc (Plumbers, Painters, etc) - M. C. Hause"
(not taken).
- Road maps - Mississippi, Ohio River, Maine
(not taken).
- (1) Letter dated 7/2/48 from Wm. Koenen
San Antonio.
- (1) Rent card from Koenen in San Antonio
(not taken).
- (1) Letter from Koenen, Toledo, Ohio 11/1/47.
- (1) Sample of carmine obtained from Koenen
(not taken).
- (1) Bill for, Fairchild Company Rent Co.
"Gardening" 1948 \$25.00
- (1) Piece of paper w/ some writing on it.
- (1) Passport.
- (1) Letter from G. Ferguson, 1948 (not taken).
- (1) Letter from T. J. Peacock dated 8/20/45
from New York, N.Y., Coughlin, Coughlin & Peacock.
- (1) State of Mich - Reg. of 1935 "Superior" Corp.
Koenen, S. J. Koenen, Inc.

Clawed

Taken out of case

- (1) piece paper w/ address of Dr. W.K. Jordan, N.Y.C.
- (1) letter w/answ. from Euclid San. Hos. in Cleveland, Ohio
- (1) Env. w/ address of Mr. H. C. & F. Norton, Va.
- (1) Letter from "Hester"

- (1) Env. w/ address of Mrs. Mary E. Powers, Boston
- (1) Piece paper w/ name and address of man
which it belongs to

(3) Sheets of plain paper (for notes)

Various stations

- (1) newspaper of Dover, N.H. - 1780 date - 1790.
"16902" handwritten
- (1) piece paper w/ name of "Harr"
- (1) Letter to "Dorothy" (?)
- (1) newspaper clippings - "Births & Deaths"
- (1) Piece of paper - "I am a & pick of female
in front of which I sit."
- (1) tennis racket (not broken)
- (1) Part of a D.W.C. (C. - T. - T. - C.)
- (1) slice of potato, not cut yet (?)
- (1) Battle - distilled water (or " ")
- (1) A [redacted] Tennis - Glass w/ sea, writing glass (not glass)
- (1) American National Bank w/numerals
- (1) squat jacket (not taken)

Claret

Taken autumn.

- (1) piece paper w/ address of Dr. W.K. Jordan, N.Y.C.
- (1) Letter w/ans. from Miller Son Real. in Paris, T.
- (1) Env. w/ address of 78 Fifth St., E. Hopkins, Va.

(1) Letter from "Hette,"

(1) Env. w/ address from Hague Envoyt. Cons.

(1) Letter paper w/return address addressed to me & dated 1870.

(3) sheets of plain paper (for ink)

Various stations.

(1) Wrapper of Danvers Rec'd. in 1783. Ind. 1780.
16802 ~~16802~~ Philadelphia

(1) Piece paper w/ name of "Harriet."

(1) Letter to "Dwight" (?)

(1) Newspaper Clippings "Birthda. of Salomon"

(1) Piece paper w/ address & post of "James" in front of "Hector" (See)

(1) Name of "J. A. L." (not taken)

(1) Picture of "W.C." (not taken)

(1) Piece paper w/ name (not taken)

(1) Battle Marshall of Water (or " ")

(1) [REDACTED] name in Chinese w/ 2 red seals (one faint)

(1) Indian Head of "P. C. P. B." w/numeral 1

(1) Spain jacket/wax (not taken)

(Closet)

miss. articles of clothing hanging in closet
& dirty (W.W.) scattered about not taken

1) pamphlet from Nebraska & Rockwood Inc.

522 Franklin St. Phila., Pa (Westmoreland)

Card #157 marked "TN-1913 - received

of Design - O. S. B. 5th - 11

1 Umbrella stand (black)

1 set anti-theft (most valuable)

3 Heavy curtains (Scattered about kitchen)

1 Peacock - rug (most valuable)

Closet

(15 sheets)

Set of papers, ~~containing~~ experiments, & Calculations

more maps (not taken)
mildates

greenish color enamel (not taken)

box for radio (not taken)

box w/ numerous shells, shells, etc.
(searched but not taken)

Books - (not Taken) Scanned

II Beyond the main range.

(1) Science mag.

(2) Map in other article.

(3) Biographies of the Earth

(4) Anthropology of Africa

(5) Statistical (not taken)

(6) Recent Advances in Geology

"Property of Ronald M. Packard"

III Various books references

A) Compt. Atlas of the Day (Prof. K.O. Friedrich
not taken)

18 maps, "Physical Map," "Geographic," etc.,
first taken)

6 Vol. of Physical Review - Vols. 72, 1947, (2nd half)
Vol. 75, 1949; Vols. 77, 78, 79, 1950.

Closet.

- (1) Power of attorney, "Josephine de Karmen" to
I Edward Beehan, 6/13/46, Tillo &
Trust Co., Los Angeles, Calif.
- (1) ~~2~~ "Surrendered Plaintiff, Target inc., 2 M.C. Hale"
(not taken).
- Road maps - New Mexico, New Eng., Maine,
(and Texas)
- (1) Letter dated 7/2/48 from W. Pleasants V. Karmen,
Los Angeles.
- (1) Post card from Karmen in State (not taken.)
- A letter from V. Karmen - Los Angeles, June 1946.
- (1) Employment service statement from W. O. Davis
(not taken)
- (1) Bill for "Dinner Gold Company" sent to
"Gardnerian, Los Angeles"
- (1) Piece paper w/ writing of "Dinner Gold Co."
- (1) Passport -
- (1) Letter from G. Ferguson, dated 4/27/48 from
D.C., (not taken)
- (1) Letter from T.E. Johnson dated 6/24/48
"John Doe - get," Niagara, Calif.
- (1) State of New York - Reg. of 1935 Pigganac Lake -
owned by Karmens.

D.C. THEODORE A. KENNEDY



Mr William Perl

Box 88

Physics Lab.

Columbia University

New York 27 N.Y.

AIR

ONIROT-ANALJATI AR3ITRAC

AMNDRB3 AIIA1W1 OTTA3ZB8 AM3ZB1

A beauty spot in Okeechobee located on
Sun Lane Boulevard, Fort Lauderdale, Fla.

Dear Well-

Send the boy to
Jacksonville. We know
where St. Augustine,
a lonely town - We
are it thoroughly
Is' last here &
you're - Love.
Come over.



POST CARD

Mr. Well Perl

16802 Lakewood Ave
Cleveland 11, Ohio

Original Sausage Tires can be seen at Charlie Black's,
Highland Highway, Coconut Grove, Miami, Fla.

Dear Brother Well-

The year is here
We just love the
fabulous place -
so rocking it all
in. We're being
asked to go
to the city
Lil's son

POST CARD

Mr. Well Perl

16802 Lakewood
Cleveland 11, Ohio



JOSEPH P. BLUM
7923 - 209TH STREET
~~BROOKLYN, N.Y.~~

Utopia Station
Flushing L.I.



Mr. Neil Purd
1257 Buckley Ave.
Lakewood 7, Ohio

2

They sent us a special price
of 169.50 - Besides this, for
paying Coal, Elmer
got a premium of six
books of Nature, or
Butterflies, Desert, Bird,
etc - we got a good
Funk & Wagnleitner dictionary -
The set amounts to about
1175 with shipping charges -

Desert Will, Sept. 5, 1948

Before receiving your letter,
I had already made up my
mind to order the Encyclopedia
Americana - I had seen it
at Carrie's house - They have
been enjoying it for a year.

The deluxe edition, which
looks like Ex. Br. # 249.
However, they have a
maroon leathercraft binding
without gold leaves which

4

the children to have
the benefit of same.
They run a Research
stitute like P. B. - too
expensive as you for ten
years & we can send
for an exhaustion-treatise
on any subject. They do
original research. This
is a wonderful service.
You might avail yourself

3

Betty made a bookcase
for the 30 volume-W.
See the book already
because the salesman
delivered them Tuesday
from the stockroom - Gilmour
since it is 8 weeks delivery
& since we paid for same.
I think its foolish to
wait since school starts
next week & we want

5

They are a moment to
good sayings & good-will.
Whence comes it is very much
impressed & when we say
you bought them as a
present for the children,
everyone remarks about what
a grand brother I have.
Joe hasn't seen Sam yet.
However shall we give
him the money -

5

of this - Bobby is sending
away a coupon for telegraph
since he wants to build one.

The books seem very
inviting & the children
are really enthusiastic
about them - you are
very right about them being
a long-term investment
in good thinking.

8
final point of our living room. Also, for ten years we can get a year book for \$5 - & keep us up to date, if we want some.

Batty is getting his treatment three times a week. Stephen is improving - He limps slightly but otherwise is getting along fine.

Stephen's hair is growing

2
Still we deduct the \$175 - from the ~~amount~~ ^{amount} we give him the balance of \$225 - That seems like a simple way of cancelling our debt - yours - Or do you have another suggestion?

We are looking forward to seeing you in November & your seeing the books at the time - They are

10
for your marvelous enduring
gift - your loving sister,
Anne

Dear Will,

Thanks for the lovely
gift. But as usual, it is Bob
who pays for everything. Besides
that, these books are not too good.
I gave them the acid test, tried
to look up *Plumbing for Supersonic*
flight & did not find anything on
it. Thanks again.

For Joe

THANKS DAD
Stanley

19

* smart 1h in talpanga
blue streak. Cleon is
a young lady-

I took the two older ones
and left to the Exposition
at Grand Central Palace -

It was wonderful - The
atomic energy exhibits were
thrilling -

Am getting winter crazy -
Again, thanks a million

Morris Birnbaum
411 Second Street, S.E.
Washington 3, D.C.



Mr. William Perl
16802 Larchwood Avenue
Cleveland 11, Ohio

letter off to him last week
and will probably hear from
him in a week or two.

I hope you are enjoying your
present work in Cleveland and
perhaps catching up on your
cultural activities, now that
your formal "education" is
over.

With best regards,

Morris Birnbaum
411 Second Street, S.E.
Washington 3, D.C.

February 8, 1950

Dear Will,

I'm just writing a few words
to say hello to you. Since last
seeing you, I have held two jobs
and am now working for the
Government in Washington, D.C.

As time goes by, I'm
starting to see, more and more,
many of the points you brought
up when I saw you at Columbia.
So far, I've been doing hack work
in engineering and haven't quite
adjusted to it. (I have enough
ego to feel I was cut out for
better things.) The answer is
more education and I'm
studying now for the Graduate

going to land. I'd like to thank you for the talk.

At present, I have a fairly nice three room apartment in Washington about five blocks from the Capitol. I share it with another fellow and the place can sleep four.

If you want to come to Washington at any time in the near future, on business or pleasure, you have a standing invitation to stay at my place.

Sam has not written a long time so I send a

Record & poem which will be given this May. If things go well, I'll start a master's degree, full time, this Fall, and try to go through a doctor's degree.

The government will still pay for two more years of school under the G.I. bill. I hope to take the above degrees in the electric power generation and transmission field.

It is strange how the things you brought out about a person's work being the most important thing to build his life around, has been brought home to me in the several

H. Morris
Box 65 Pupin
Columbia University
New York City



Mr. W. Pest
National Advisory Council
for Aeronautics
Cleveland Airport
Cleveland, Ohio

possible to control nuclear or
chemical reactions on which would
produce a wave regime
in a cavity still fluid. Thought it is
only, however to talk about such
a possibility, do you think the
NACA could be interested in continuing
such a device if it appears feasible?
For at Columbia they ~~would~~ would not
be interested, of course. For they would
use ~~it~~ any results that I might get for
their radar work.

In this connection I noticed
in the most recent physical Review^(Dec 15), a
technique for using the Slichter-Sears
theory of scattering of light by sand
(and the particle now tiny) to cause
modulation of light ^{for} measurement. Whether this method has
any ~~importance~~ I don't know.

As ever
Harry

Box 85
Paper Physics Lab.
Columbia University
New York City
September 18, 1948

Dear Bill,

I'm afraid I've been very much
remiss in my correspondence. However,
though the summer was pleasant, nothing
important enough to write about has
happened.

I'm sorry I missed you when
you came to New York to see Tom
Körvin just before he left. Were
you able to catch him? What was
his reaction when you showed him
your results? If your paper is
finished, and you have some extra
copies, I'd like very much to see
what your final results were.

I spent most of the summer
teaching. In the first session

physics, and I and completely
familiarized myself with the
course. It was easier and
more pleasant in physics. It
was far clearer and about
longer to make a man with
calling the scientist. In the
area of science, which has great
value, I was teaching it. It was
a lighter load than in it.

regular winter or spring sessions
because fewer students signed up
than expected.

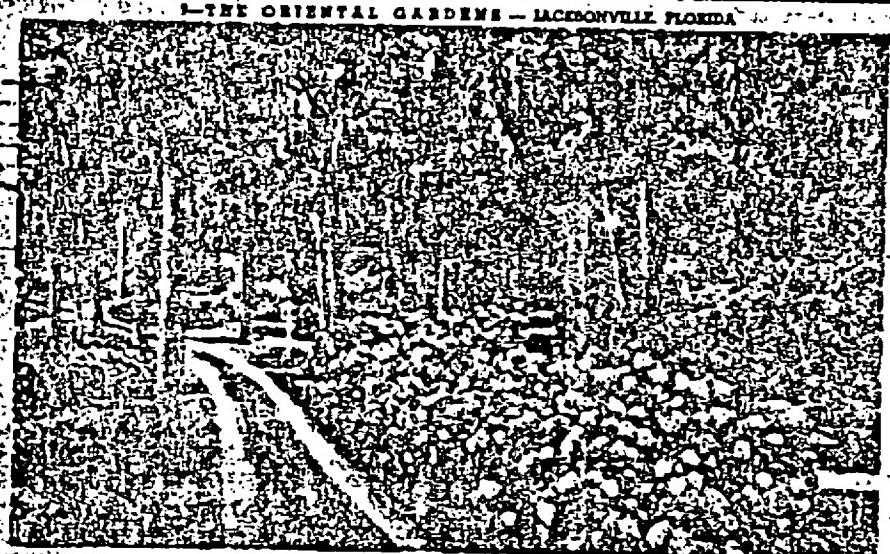
Koopman's and Heitz's course
in the theory of partial diff. eqns and
theory of solids respectively were
both very good, except that I had
had most of the material previously.
Heitz is very meticulous in the presentation
of his lectures and they were very instructive.
even though largely descriptive.

I finally broke down and bought
the book, and it is through much

of the summer and a lot of thinking
I found it very good even though the
treatment of almost every topic is in
highly unconventional. I spent much
of my time correlating his results
with those of more conventional
authors. Dirac, however, has a few
materialistic outlook which most
other writers don't have. I'm
finally learning what second
quantization ~~is~~ really is although
I'm having enough trouble relating
Dirac's treatment to that of
Wentzel.

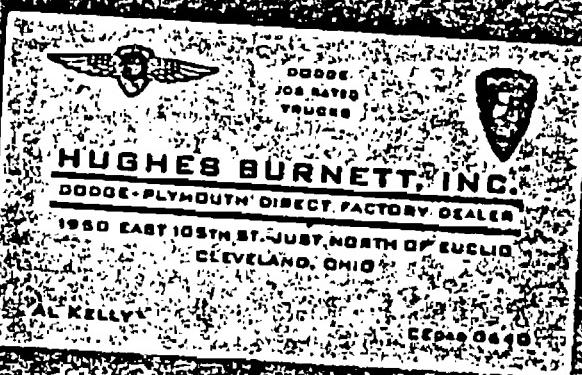
This Fall I'm taking Beth's
course in nuclear physics and
his seminar on elementary
particle theory. I'm also going to
start seriously on the problem
of pressure broadening of micro-
wave absorption spectra. It occurs
to me that if the resonance line
^{width} can be related to the pressure

—THE ORIENTAL GARDENS — JACKSONVILLE FLORIDA



The Soursop Tree
Miami, Florida





By ARTHUR MILLER
Author of "Death of a Salesman,"
which celebrates its first
anniversary on Friday.

EXPERIENCE tells me that I will probably know better next year what I feel right now about the first anniversary of "Death of a Salesman"—it usually takes that long to understand anything. I suppose I ought to try to open some insights into the play. Frankly, however, it comes very fuzzily to mind at this date. I have not sat through it since dress rehearsal and haven't read it since the proofs went to the publisher. In fact, it may well be that from the moment I read it to my wife and two friends one evening in the country a year ago last fall, the play cut itself off from me in a way that is incomprehensible.

I remember that night clearly, best of all. The feeling of disaster when, glancing up at the audience of three, I saw nothing but glazed looks in their eyes. And at the end, when they said nothing, the script suddenly seemed a record of a madness I had passed through, something I ought not admit to at all, let alone read aloud or have produced on the stage.

Tears and Laughter

I don't remember what they said, exactly, excepting that it had taken them deeply. But I can see my wife's eyes as I read a— to me—hilarious scene, which I prefer not to identify. She was weeping. I confess that I laughed more during the writing of this play than I have ever done, when alone, in my life. I laughed because moment after moment came when I felt I had rapped it right on the head—the non sequitur, the aberrant but meaningful idea



Arthur Miller.

racing through Willie's head, the turns of story that kept surprising me every morning. And most of all the form, for which I have been searching since the beginning of my writing life.

Writing in that form was like moving through a corridor in a dream, knowing instinctively that one would find every wriggle of it and, best of all, where the exit lay. There is something like a dream's quality in my memory of the writing and a day or two that followed its completion.

I remember the rehearsal when we had our first audience. Six or seven friends. The play working itself out under the single bulb overhead. I think that was the first and only time I saw it as others see it. Then it seemed to me that we must be a terribly lonely people, cut off from each other by such massive pretense of self-sufficiency, machined down so fine we hardly touch any more. We are trying to save ourselves separate-

ly, and that's immoral, that is the corrosive among us.

On that occasion, more than any time before or since, the marvel of the actor was all new to me. How utterly they believed what they were saying to each other!

To watch fine actors creating their roles is to see "prized the innocence, the naive imagination of man liberated from the ghosts of the past. They were like children wanting to show that they could turn themselves into anybody, thus opening their lives to limitless possibilities.

Kazan's Technique

And Elia Kazan, with his marvelous rules, tripping the latches of the secret little doors that lead into the always different personalities of each actor. That is his secret; not merely to know what must be done, but to know the way to implement the doing for actors trained in diametrically opposite schools, or not trained at all. He does not "direct," he creates a center point, and then goes to each actor and creates the desire to move toward it. And they all meet, but for different reasons, and seem to have arrived there by themselves.

Was there ever a production of so serious a play that was carried through with so much exhilarating laughter? I doubt it. We were always on the way, and I suppose we always knew it.

There are things learned—I think, by many people—from this production. Things which, if applied, can bring much vitality to our theatre.

There is an limit to the expansion of the audience's imagination so long as the play's internal logic is kept inviolate. It is not

Continued on Page Three

THE 'SALESMAN' HAS A BIRTHDAY

Continued from Page 1

true that conventionalism is demanded. They will move with you anywhere, they will believe right into the moon as long as you believe who tell them this tale. We are at the beginning of many expiations of form. They are waiting for wonders.

A serious theme is entertaining. Look back at us astonished that extent that it is not trifled with, however angled, but met in mid-air. They will not consent to suffer while the creators stand by with tongue in cheek. They have a way of knowing. Nobody can blame them.

Remember there have been certain disappointments, one above all. I am sorry the self-realization of the older son, Biff, is not a weightier counterbalance to Willy's disastrous

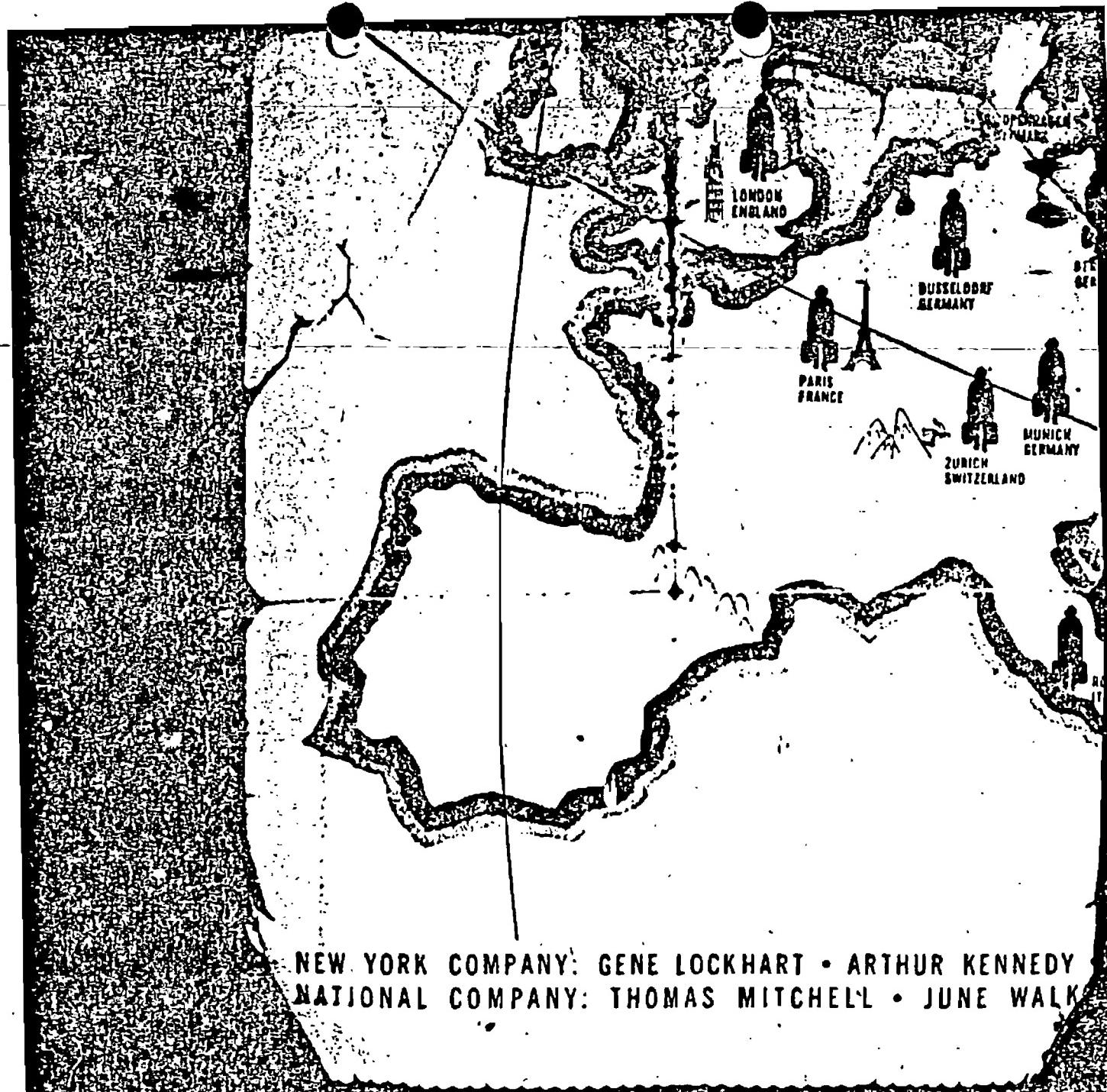
all we train for is to take, as though nothing less will keep the world at a safe distance. Every day we contradict our will to create, which is to give. The end of man is not security, but without security we are without the elementary condition of humanness.

In the Future

A time will come when they will see something truly in the competition for the means of existence. But already we are beginning to ask of the great man, not what has he got, but what has he done for the world. We ought to be struggling for a world in which it will be possible to lay blame. Only then will the great tragedies be written, for where no order is believed in, no order can be breached, and thus all disorders of man will

Willy Loman is that he gave his life, or sold it, in order to justify the waste of it. It is the tragedy of a man who did believe that he alone was not meeting the qualifications laid down for mankind by those clean-shaven frontiersmen who inhabit the peaks of broadcasting and advertising offices. From those forests of canned goods high up near the sky, he heard the thundering command to succeed as it ricocheted down the newspaper-lined canyons of his city, heard not a human voice, but a wind of a voice to which no human can reply in kind, except to stare into the mirror at a failure.

So what is there to feel on this anniversary? Hope, for I know now that the people want to listen. A little fear that they want to listen so badly. And an old in-



NEW YORK COMPANY: GENE LOCKHART • ARTHUR KENNEDY
NATIONAL COMPANY: THOMAS MITCHELL • JUNE WALKER

A JOY TO BEHOLD...AN EVENT PLAYGOERS
SHOULD NOT MISS

"WONDERFUL FUN"

—WATTS, POST-HOME NEWS

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Arthur Miller.

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all we train for is to take, as though nothing less will keep the world at a safe distance. Every day we contradict our will to create, which is to give. The end of man is not security, but without security we are without the elementary condition of humanness.

In the Future

A time will come when they will look back at us astonished that we saw something holy in the competition for the means of existence. But already we are beginning to ask of the great man, not what has he got, but what has he done for the world. We ought to be struggling for a world in which it will be possible to lay blame. Only then will the great tragedies be written, for where no order is believed in, no order can be breached.

Willy Loman is that he gave his life, or sold it, in order to justify the waste of it. It is the tragedy of a man who did believe that he alone was not meeting the qualifications laid down for mankind by those clean-shaven frontiersmen who inhabit the peaks of broadcasting and advertising offices. From those forests of canned goods high up near the sky, he heard the thundering command to succeed as it ricocheted down the newspaper-lined canyons of his city, heard not a human voice, but a wind of a voice to which no human can reply in kind, except to stare into the mirror at a failure.

So what is there to find on this anniversary? Hope, for I know now that the people want to believe. A little fear that they want to hate so badly. And an old gr



Please accept our earnest
congratulations. We hope
that this university
sense of your formal
education will bring you
more serious difficulties
than your detachment
from that great institution
of learning - the C.U.
P. Cyprus Dept. When you
look back on it, I hope you
will find it worth while

R. A.
Worley A.

JUDSON
HEALTH
CENTER



237 Thompson Street
New York 12, New York



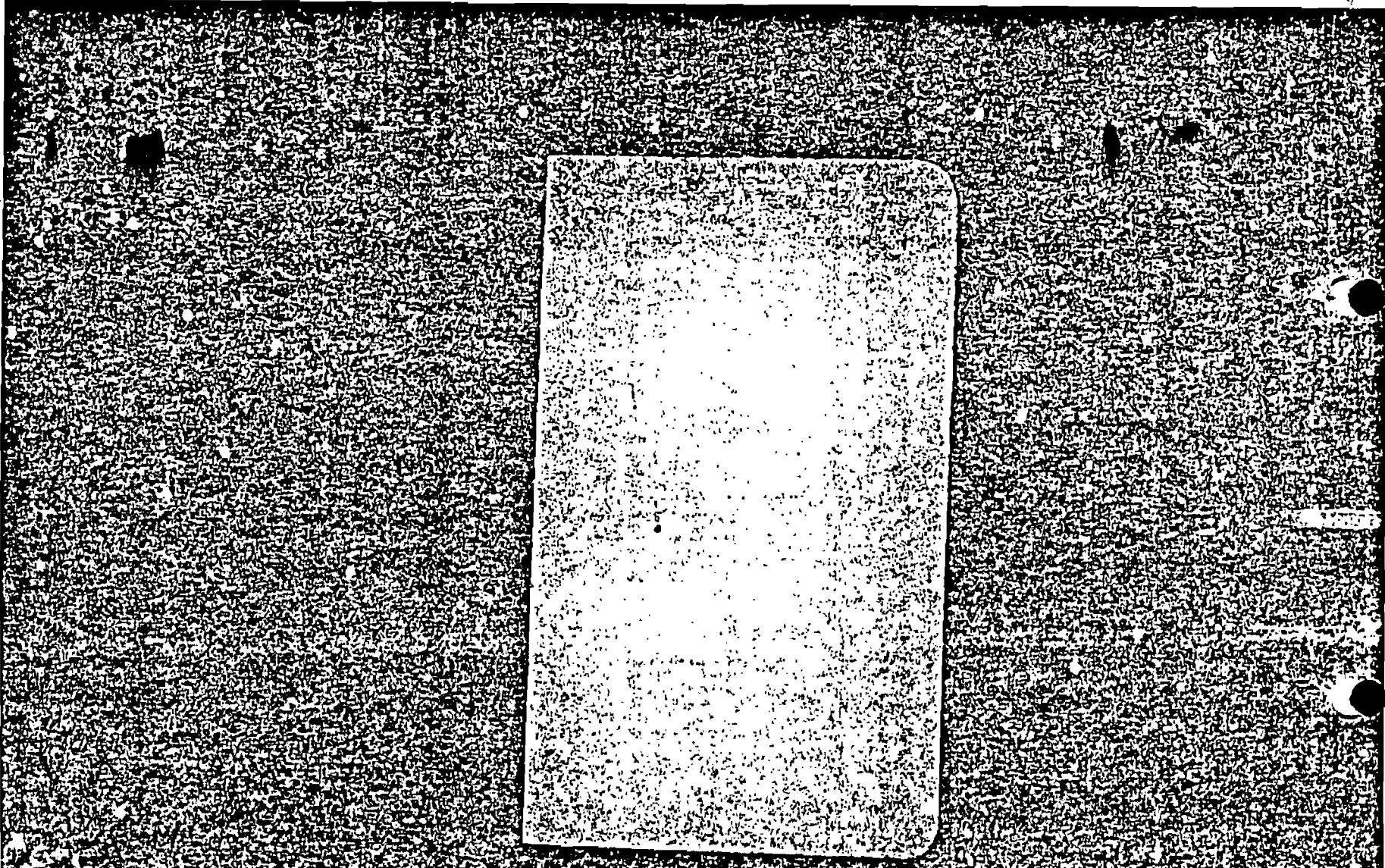
CONTRIBUTION BOOK



A few of the friends of the Judson Health Center are listed in this book. They have kindly granted permission for the facsimile use of their names.

NAME	ADDRESS	AMOUNT
J. R. Allison	10 West St.	\$10.00
Misses' Drugs	220 Madison Ave.	5.00
V. N. Bennett	1120 Liberty St.	9.00
First - time	153 Franklin St.	3.00
Franklin Library	200 Waverly Pl.	1.00
Louis A. Bauer M.D.	140 E. 54 St.	.55
Pasquale Andriano	1854 78th Street	14.00
John Garisch	200-01-118 Avenue of Albany	2.00
James G. Ferguson	160 Broadway St.	5.00
Ella Thielke	1151 Madison Ave	8.10
225 1/2 10th St.	211 1/2 10th Street	1.00
John L.	21 E. 10 th St.	18.00
Bogart	14 Washington Place	.77
Miss Collins	38-57-121½ 2nd	53.00
James D. Foss	157-3 Madison St.	10.
Leigh S. Parker	Box Washington Ave.	15.00

NAME	ADDRESS	AMOUNT
Philip Gordon	299 West 17 th St	10-
mrs. Joseph De Litta	475 West Broadway	2.00
Peter Lippman	100 Charlton St - 500	
Emily Nichols Hatch	Tarrytown, N.Y.	\$3.00
Maria Busatti	153 Pierrepont St. 1 st fl 1.00	
Theel F. Bancroft	53 Leroy St.	5.00
O'Arcy Van Bokkelen	312 West 75 th St.	\$2.00
R. S. Castelli M.D.	323 Hudson St	5.00
Anne Wells	134 West Houston St	3.00
Anthony Fannle	90 Thompson St.	10 ^c
Mary A. Ross	546 West Broadway	5.00
Gina C. Porter	402 Steinway Ave Brooklyn 33, N.Y.	1.00
I. Halfmann	1700 Harrison Line 2-	
John K. Craig	172 University Pl.	10.00
John Beltrame	226 Thompson St	3. ^c
John Dampf at Cannino	West 72 nd St	\$20.00



ESSENTIAL REQUIREMENTS TO OBTAIN A PASSPORT

1. Proof of citizenship.
 - (a) Birth Certificate bearing impression seal of issuing Board of Health and filing date; or,
 - (b) Naturalization Certificate.
~~Neither necessary if applicant has had a previous American passport.~~
2. Two recently taken photographs, $2\frac{1}{2}$ to 3 inches square.
3. Letter from business concern or organization represented, stating where, when, why and for how long going. Persons proceeding abroad for personal reasons should write their own letter giving these details. No letter is required if proceeding to countries in the Western Hemisphere.
4. Identifying Witness, American Citizen over 21 who has known the applicant for at least two years. Witness may be a relative. No witness is required if applicant can present at the time of making application a previous American passport containing an identifiable photo of applicant.
5. Fee - \$10.00, Cash. Checks not acceptable.

D. O. - Jim Perl

PASSPORT / M.E. PHOTOGRAPHERS

7733 17th

DETROIT, MICHIGAN

ROD 105, 6015 SIXTY AVE., M.M.



STATE OF OHIO
CUYAHOGA COUNTY

The State of Ohio, I, NELSON J. BREWER, Probate Judge and P.L. Office Clerk of the Probate Court,
CUYAHOGA COUNTY
within and for said County and in other respects the Film Institute and Manuscripts and Papers are required by the
law of the State of Ohio to be kept, hereby certify that the foregoing is copied from Journal No. page 4758
of the proceedings of said Court and that the same has been compared and is a correct transcript thereof.

In witness whereof, I do hereto subscribe my name

and affix the seal of said Court this

+ 1 day of April, 1945

Nelson J. BREWER
Probate Judge

N. Nelson J. BREWER, Probate Judge

The State of Ohio, } Attest: NELSON J. BREWER, Probate Judge and No. 100 Court of the Probate Court,
CUYAHOGA COUNTY
whilst and for said County, and in whose County the Probate Journals and Books of said Court are recorded by the
Court Clerk, do hereby certify that the foregoing is copied from Journal page 488
of the State of Ohio to be kept, hereby certify that the foregoing is copied from Journal page 488
of the proceedings of said Court and that the same has been compared and is a correct transcript thereof.

In witness whereof, I do hereunto subscribe my name

and seal the seal of said Court this 4th day of Jan. 1955

Nelson J. Brewer

Probate Judge

William E. Gubbs Deputy Clerk

Foster-Davis Assn.
Cleveland, O

Dear Mr. Foster,

I wish to report an automobile accident in which my automobile was hit and badly damaged by another vehicle. The circumstances were these. On January 14, 1929 at 11:11 my car was parked slightly north of 2101 Rockey River Drive, facing south, and under a street lamp on telephone pole. I had just emerged from a friend's home and was walking toward the car in order to enter it and take off. When I was a few yards from the car it struck another vehicle, heading east, which struck its left rear wheel first against the telephone pole while the car was glancing off to the right out a lawn with it, but parallel to it.

The police were called and agreed immediately that the fault was clearly with the driver of the other car who was not acknowledged at all, in fact he stated he did not care at all, apparently because of damage.

My car was towed to the garage of the Baker-Victor Co. at 2101 Detroit Ave. This garage to my eyes appears to be extremely clean, body and frame has been treated completed fast, especially frame the rear. The rear wheel assembly definitely also has damage, possibly.

Please advise as to proper course of action in obtaining substitution of damage from the other party. A claim for the other car is made.

but not driving. He is owned by the Penn Brew Farms Co.
His name is

Robert P. Langford

141939 - 141940

Phone AC 5-1111

Lecturer at U of C ET 365

Driver of car Robert P. Langford

1354 Riverdale Rd.

Phone BO 4341

Number of driver license K 492015

1000 feet above city
14th Street

On June 1st
beginning of morning
battle of Washington
battle of Yorktown
battle of York
July 1st 1863

1. Battle of
the Bulge

Brotherhood
of
Masons

unmyelinated peripheral network

visceral organ

epithelial, connective

tissue

mechanoreceptors and organs of pain

exteroceptors

interoceptors

intrafusal fibre

mechanotrans-

ducer

Fulbright Act Funds

Board of Foreign Scholarships

Students - Institute of International Education

2 West 45 St.

New York 19, N.Y.

Att. Mr. Herbert Briskel

Prof. & post-dated check enclosed -

Confidential Board of International Research Commissions

2101 Constitution Ave.

Washington 25, D.C.

Attn. Mr. John T. Bowles

Exec. Sec.

$$\sqrt{a^2 + b^2} = c, \quad ab = \sqrt{c^2 - b^2}$$

$$ca + pb = c$$

$$ac^2 + bc^2 - cpb = 0$$

$$= ac^2 + bc^2 - cpb = \sqrt{c^2(a^2 + b^2)} - \sqrt{c^2(a^2 + b^2)} = 1 - \sqrt{a^2 + b^2}$$

$$a = ac - pb = ac + pb = \sqrt{c^2 + b^2} \quad ab = \sqrt{c^2 - b^2}$$

Mrs. C. Brown
El. Ridge 2-5720
196 Pippinot Ave

Insurance
silver plates

Am. Standard
3+2 medium
Va 6-200

Babb Beckman St.
size 9 1/2

Rat - antifreeze
Whelk

1564.67

antifreeze and oil
see also
Agitation in the

935 Tiffey St.
New York 59, N.Y.
Mar. 22, 1948.

United States Department of State

Passport Division

New York, N.Y.

Dear Sir,

I should like to apply for a passport for the purpose of travel and study abroad. I am at present completing work for the degree of Doctor of Philosophy in Physics at Columbia University in New York. My purpose in going abroad is to continue my studies in this field.

(Replace by) I have in mind studying in Great Britain, France, Holland and possibly Ireland.)^{to}

A preliminary object of my trip is to visit relatives in Paris. (Add 1)

I wish to stay abroad for about a year, to start approximately Aug. 1, 1948.

Very truly yours,

William Paul

①
I have in mind studying with Professor S. Goldstein in the
University of Manchester, ^{England}, with Professor J. M. Burgers in the
University of Delft in Holland, with Professor F. H. v. Klinken
in Paris, France and possibly at the Dublin Institute for
Advanced Studies at in Ireland.

②
These relatives and their relationship to me are
Mrs. Eva Berlinerblau (my cousin)

7 Rue St. Claude
Paris 3, France

Mrs. Mollie Volkovitch (my aunt)

28 Rue Basfor
Paris France.

William Pearl
935 Madison Ave.
New York, N.Y.

United States Department of State
Office of Control, Passport Division

Haley J. Ledger D.Sc., microbiology

Sally Dickson A.D. M.S. M.D.	Pediatrics	2103 adhd
Mary Ellen Hartman A.B.	antib.	2109 adhd
Margaret P. Heidrich A.B.	biochemistry	2109 adhd
Eric J. Klein B.A. M.A.	biochem.	2105 adhd
Mary Kay Kurfess B.S.	anatomy	2109 ad.
Rosabelle McAdam B.S.	biochem.	2109 ad.
Amabelle Miller A.C.	biochem.	2105 ad.
Marguerite E. Patterson B.S. B.S. B.S.	Pediatrics	2103 ad.
Beth S. Rubin M.S. B.A.	biochem.	2105 ad.
Megan O. Shilling A.B.	physiol.	2108 ad.
Edna K. Hayes Ph.D.	biochem.	2109 ad.
Marilyn H. Stole B.S.	pharmacology	2109 ad.
Carol Ellen Tsigas A.B.	antib.	2108 ad.

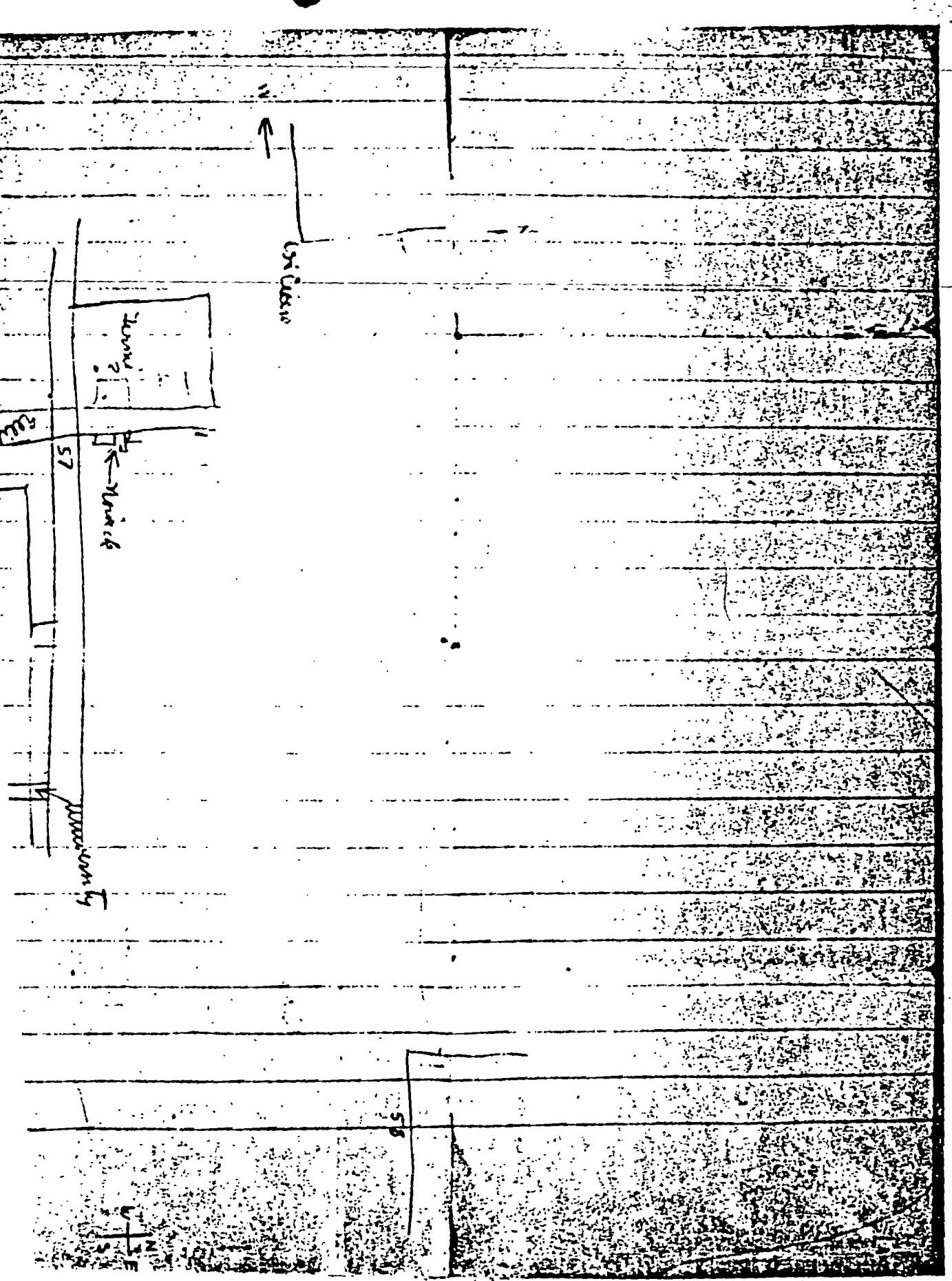
44 Cdr. 2:45 AM 10/1
arrived in St. Louis 1:30 PM 10/1 left 9:00 AM - 10/3

Landing - making a light instrument. See by accident auto pilot for main + parallel flight of 2 planes.
Kite biology ~~method~~

Their in bonds so we are probably wrong now.

This - reflecting off of glass wings.

Tell - I think of getting just another. It's at present available.



$$(h+h) = \left(\rho + \frac{1}{\rho}\right)^{\frac{1}{2}} = \pm \sqrt{(\rho + \frac{1}{\rho})^2 + \frac{1}{\rho^2}}$$

$$= \rho + \frac{1}{\rho} - \frac{1}{\rho^2} = \rho + \frac{1}{\rho} - \frac{1}{\rho^2}$$

$$\Delta \eta \text{ with } H = H \times \cos(\eta) = \langle \bar{H} | H' \rangle$$

$$\langle H' | \bar{H} | H'' \rangle H'' - H \langle H' | \bar{H} | H'' \rangle = \bar{H} \langle H' | H'' \rangle$$

75.7 part 3

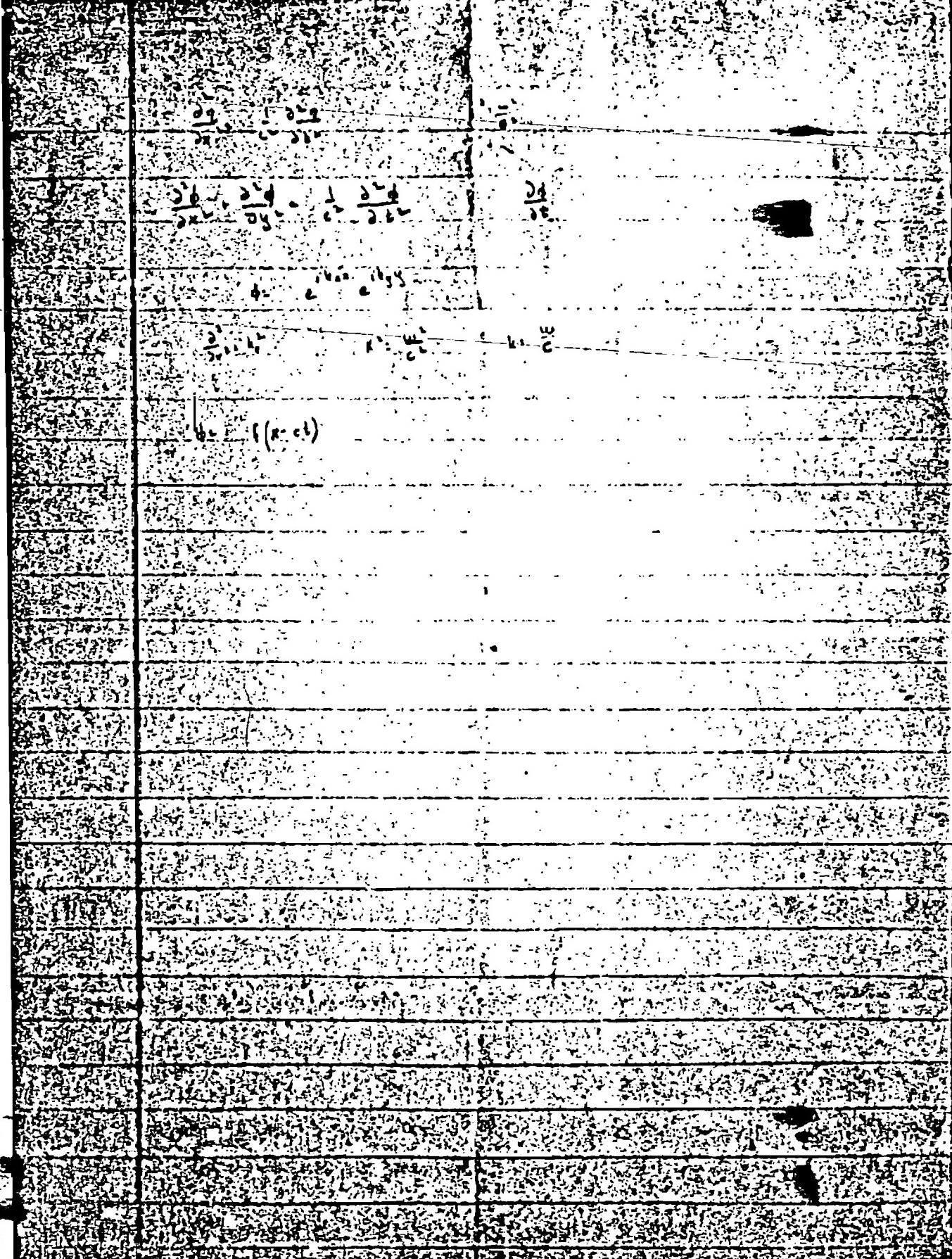
Ma 4-2-59

$$\left\langle \frac{2}{g_r} \psi | g_i \cdot \vec{g}_n \right\rangle = \left\langle \frac{2}{g_r} | g_i \cdot \vec{g}_n' \right\rangle = \frac{\partial \langle g_i' \rangle}{\partial g_r} = \frac{\partial \langle \psi | g_i \cdot \vec{g}_n' \rangle}{\partial g_r}$$

$$= - \left\langle \psi | \frac{2}{g_r} | g_i' \cdot \vec{g}_n' \right\rangle$$

$$- i h \frac{2}{g_r} | g_i' \cdot \vec{g}_n' \rangle = i h \frac{2}{g_r} | g_i \cdot \vec{g}_n' \rangle$$

$$p_r(g_i' \cdot \vec{g}_n') = i h \frac{2}{g_r} | g_i \cdot \vec{g}_n' \rangle$$



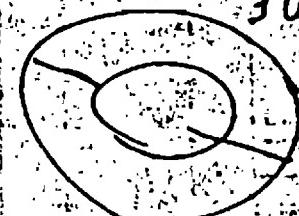
$f(x-ct)$

Mina

433 C 51 81

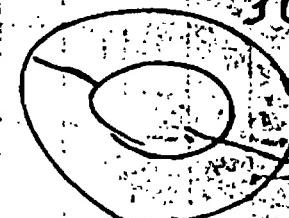
PL 5-0538

301



Mina
433 C 51.50
Pl 5-0538

30



$$-ab + b^2 = -2b \cdot b_{12} + b_{11}b_{22} = 2a_1b_{12}b_{22} = 2a_1b_{12}b_{22} = 2a_1$$

tT

t₂

0

2.

$$H_r = S^{-1} H^e S$$

$$\begin{aligned} S^2 &= \left(1 + \left(\frac{i}{\omega_c} \right) \int_{-\infty}^{\infty} H^2 dx_r + \left(\frac{i}{\omega_c} \right)^2 \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} H^2 H^2 dx_r dx_r + \left(\frac{i}{\omega_c} \right)^3 \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} H^2 H^2 H^2 dx_r dx_r dx_r \right) \\ H_r &= \left(1 + \left(\frac{i}{\omega_c} \right) \left[H_r^2 + \left(\frac{i}{\omega_c} \right)^2 \int_{-\infty}^{\infty} H^2 H^2 + \left(\frac{i}{\omega_c} \right)^3 \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} H^2 H^2 H^2 \right] \right) H^e \left(1 + \left(\frac{i}{\omega_c} \right) \left[H_r^2 + \left(\frac{i}{\omega_c} \right)^2 \int_{-\infty}^{\infty} H^2 H^2 + \left(\frac{i}{\omega_c} \right)^3 \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} H^2 H^2 H^2 \right] \right) \\ &= H^e + \frac{i}{\omega_c} \int [H_r^2, H^e] + \left(\frac{i}{\omega_c} \right)^2 \iint [H_r^2, H^e] H^2 + H^e H_r^2 H^2 \end{aligned}$$

$$H_r(x_0) = H_r^0(x_0) + \frac{i}{\omega_c} \int_{-\infty}^{x_0} dx_r \left[H_r^2(x_r), H^e(x_r) \right] + \left(\frac{i}{\omega_c} \right)^2 \int_{-\infty}^{x_0} dx_r \left[[H_r^2(x_r), [H_r^2(x_r), H^e(x_r)]] \right]$$

$H_r^0, H^e, H^2 = H^e H^2$

$$n^* = n^* S^* = n^* S^{-1}$$

$$S(\omega) S(\tau)^* = \left(1 - \frac{i}{\omega_c} \left(\int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \left(\cdots \int_{-\infty}^{\infty} \left(\cdots \int_{-\infty}^{\infty} \right) \cdots \right) \cdots \right) \right)$$

$$\begin{aligned} S(\omega) S(\tau)^* &= \left(1 + \left(\frac{i}{\omega_c} \right)^2 H_r^2(x_0) + \left(\frac{i}{\omega_c} \right)^3 \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} H_r^2 H_r^2 dx_r dx_r dx_r \right) \left(1 - \frac{i}{\omega_c} \left(\int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \left(\cdots \int_{-\infty}^{\infty} \left(\cdots \int_{-\infty}^{\infty} \right) \cdots \right) \cdots \right) \right) \\ &= 1 - \frac{i}{\omega_c} \left(\int_{-\infty}^{\infty} H_r^2(x_r) \left(\frac{i}{\omega_c} \right)^2 \left(\int_{-\infty}^{\infty} \cdots \int_{-\infty}^{\infty} \cdots \right) \cdots \right) \end{aligned}$$

$$U(t_2) = \left(1 - \frac{i}{\omega_c} \int_{t_1}^{t_2} H_1(\tau) d\tau\right) \left(1 - \frac{i}{\omega_c} \int_{t_1}^{t_2} H_2(\tau) d\tau\right) \left(1 - \frac{i}{\omega_c} \int_{t_1}^{t_2} H_3(\tau) d\tau\right) \cdots \left(1 - \frac{i}{\omega_c} \int_{t_1}^{t_2} H_n(\tau) d\tau\right)$$

$$= \left(1 - \frac{i}{\omega_c} \int_{t_1}^{t_2} H_1(\tau) d\tau + \left(\frac{i}{\omega_c}\right)^2 \int_{t_1}^{t_2} H_1(\tau) d\tau \int_{t_1}^{\tau} H_2(s) ds + \left(\frac{i}{\omega_c}\right)^3 \int_{t_1}^{t_2} H_1(\tau) d\tau \int_{t_1}^{\tau} H_2(s) ds \int_{t_1}^s H_3(u) du + \cdots + \left(\frac{i}{\omega_c}\right)^n \int_{t_1}^{t_2} H_1(\tau) d\tau \int_{t_1}^{\tau} H_2(s) ds \int_{t_1}^s H_3(u) du \cdots \int_{t_1}^{s_{n-1}} H_n(u) du\right)$$

$$= \left(1 - \frac{i}{\omega_c} \int_{t_1}^{t_2} H_1(\tau) d\tau + \left(\frac{i}{\omega_c}\right)^2 \int_{t_1}^{t_2} \int_{t_1}^{\tau} H_2(s) ds + \int_{t_1}^{t_2} \int_{t_1}^{\tau} \int_{t_1}^s H_3(u) du \cdots + \left(\frac{i}{\omega_c}\right)^n \int_{t_1}^{t_2} \int_{t_1}^{\tau} \cdots \int_{t_1}^{s_{n-1}} H_n(u) du\right)$$

$$\text{the } \frac{\partial U}{\partial t} = H_1(t_2) \left(1 - \frac{i}{\omega_c} \int_{t_1}^{t_2} H_2(\tau) d\tau\right) \cdots$$

$$= H_1 U$$

$$\Psi = U \Psi_0$$

$$\text{the } \frac{\partial \Psi}{\partial t} = \text{the } \frac{\partial U}{\partial t} \Psi_0 = H_1 U \Psi_0$$

$$TJS, H, S = \frac{1}{2} \vec{S} \cdot \vec{S}$$

$$TJS, H, S = \frac{1}{2} \vec{S} \cdot \vec{S} + JS, H, S$$

$$TJS, H, S = \frac{1}{2} \vec{S} \cdot \vec{S} + JS, H, S$$

T_0

$$d^2 \rightarrow d\sigma = T$$

$$\tau = \frac{T}{pd} - \frac{T d\sigma}{d\sigma} = \frac{T_0}{ds}$$

$$Q = c \int j_\mu(x') dx'$$

$$= \frac{iec^2}{2} \int (\bar{\psi}(x) \gamma_\mu \psi(x) - \bar{\psi}(x') \gamma_\mu \psi(x')) dx'$$

$$[H_0, Q] = \frac{iec^2}{2} \int [H_0, (\bar{\psi}(x) \gamma_\mu \psi(x) - \bar{\psi}(x') \gamma_\mu \psi(x'))] dx'$$

$$= \frac{iec^2}{2} \int [\bar{\psi}(x), \bar{\psi}(x')] \gamma_\mu \psi(x) + \bar{\psi}(x')$$

$$(Q \psi - \psi Q) \delta(x') + \psi Q \delta(x') = -e \psi g(x') + \psi Q \delta(x') = (Q - e) \psi \delta(x')$$

$$\begin{aligned} M_2 &= \int (p - m)^2 dF = \int (p - m)(m + \eta) dF = (p_m - m^2) \eta + \eta^2 = p_m \eta \\ &= \int (p - m + \eta - c)^2 dF = \int (p - m)^2 dF + \eta^2 - 2(p - m)\eta + 2c(p - m) \eta \\ &= p_m \eta + \eta^2 - c^2 \end{aligned}$$

$$E[(\alpha s(t) - \alpha E(s(t)))] = E[\alpha^2 (s - E(s))^2] = \alpha^2 E[(s - E(s))^2] = \alpha^2 D(s)$$

$$\begin{aligned} E[(S + \eta)(E(S) + E(\eta))] &= E[S^2 + S\eta + \eta E(S) + \eta E(\eta)] \\ &= E[(S + \eta)^2] + E(S\eta) = (S^2 + S\eta^2) + E(S)(E(\eta) - E(\eta)) \\ &\quad + E(\eta)(E(S)) = (S + \eta)^2 + S\eta^2 \end{aligned}$$

$$g(t) = \int_{-\infty}^{\infty} f(x) e^{itx} dx = \sum p_r s(r, -t) e^{itx} dx + \sum p_r e^{itx}$$

$$\begin{aligned}f(x) &= \frac{1}{\pi} \int_{-\infty}^{\infty} g(t) e^{-itx} dt = \frac{1}{\pi} \left(\sum p_r s(r, -t) e^{-itx} \right) dt \\&= \sum p_r s(r, -t) e^{-itx}\end{aligned}$$

$$g(t) = \int f(x) e^{it(x-m)} dx = \int \sum p_r s(r, -t) e^{it(x-m)} dx$$

$\log \log (f_1 - f_2) = -1 - 2.4$

$$f(x) = \int g(h) e^{ihx} dh$$

$$g(h) = \int s(x') e^{ihx'} dx' = \int \int s(x') e^{-i(x'-x)} dx' dh$$

$$g(h) = \int s(x') e^{ihx'} dx'$$

$$f(x) = \frac{1}{2\pi} \int f(x') \left[\int e^{i(x'-x)} dh \right] dx' = \int s(x') \delta(x-x') dx' = s(x)$$

$$\int e^{ihx} dh = \lim_{n \rightarrow \infty} \left[\sum_{k=1}^n e^{i h_k (x)} \right] = \lim_{n \rightarrow \infty} \frac{e^{i h_n (x)}}{i h_n (x)} \Big|_0^{\infty} = \frac{1}{i(x)}.$$

$$\int e^{ihx} dh = \lim_{n \rightarrow \infty} \left[\sum_{k=1}^n e^{i h_k (x)} \right] dh = \lim_{n \rightarrow \infty} \frac{e^{i h_n (x)}}{i h_n (x)} \Big|_0^{\infty} = h - \frac{1}{i h(x)}$$

$$\Rightarrow s(x) = \lim_{n \rightarrow \infty} \left(\frac{1}{2\pi} - \frac{1}{i h(x)} \right) = h + \frac{1}{2\pi i h(x)} = \frac{1}{2\pi i h(x)}$$

$$\therefore s(x) = \frac{1}{2\pi} \int \frac{dx}{x} - \frac{1}{2\pi i h(x)} \int \frac{dx}{x} + \frac{1}{2\pi i h(x)} \int \frac{dx}{x} = \frac{1}{2\pi i h(x)} \int \frac{dx}{x}$$

$$\int \frac{dx}{x} = \log x + C = \int \frac{dx}{x+iC} \int \frac{dx}{x-iC}$$

$$= P \int \frac{dx}{x} + \pi i = P \int \frac{dx}{x} + \pi i \int \frac{dx}{x+iC}$$

$$\frac{dx}{x+iC} = \frac{1}{x+iC} + \frac{iC}{x+iC}$$

$$\frac{1}{2\pi} \left[s(x-i) + s(x+i) \right] = \frac{1}{2\pi} \left[\int_0^\infty e^{-i(x-i)} dw + \int_0^\infty e^{-i(x+i)} dw \right] = \frac{1}{2\pi i} \ln \frac{1}{x-i} - \frac{1}{x+i}$$

$$= \frac{1}{2\pi i} \ln \frac{x+iC - x-iC}{(x-i)^2 - i^2} = \frac{1}{2\pi i} \ln \frac{2iC}{x^2 - 1 + 2ix}$$

$$\int \frac{dx}{x+iC} = P \int \frac{dx}{x} - \pi i \int \delta(x) dx$$

$$\frac{dx}{x+iC} = \frac{1}{x+iC} - \frac{iC}{x+iC}$$

$$\therefore s(x) = \pi i \left(\frac{1}{x+iC} - \frac{iC}{x+iC} \right) = \pi i \frac{1}{x^2 + C^2} = \frac{\pi i}{C^2 + x^2}$$

Conc. ρ , η

$f(\eta) = \frac{f(\rho)}{\rho}$ (for $\eta = \rho$)

$$\eta = f^{-1}(\rho) = \frac{f(\rho)}{\rho} = \frac{f(\rho)}{\rho} \cdot \frac{1}{\rho} = \frac{f(\rho)}{\rho^2}$$

ex. $\rho = 1000$, $G(\rho) = f(\rho) = 1000$

$$G(\rho) = \frac{f(\rho)}{\rho^2} = \frac{1000}{1000^2} = 10^{-3}$$

increasing $G(\rho)$ \rightarrow $f(\rho) \propto \rho^2$ \rightarrow $\rho \propto \sqrt{f(\rho)}$

$$\rho \propto \sqrt{f(\rho)}$$

$$\rho = \sqrt{f(\rho)} = \sqrt{G(\rho)} = \sqrt{10^{-3}} = 0.0316$$

Conc.

$G(\rho) = \frac{f(\rho)}{\rho^2}$

$\rho = 1000$, $G(\rho) = 10^{-3}$

$\rho = 1000$, $G(\rho) = 10^{-3}$

$G(\rho) = \frac{f(\rho)}{\rho^2}$

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$$f(x) = \frac{1}{(1+x)^{n+1}} = \int_0^x \frac{t^n dt}{(1+t)^{n+1}} = \int_0^x \frac{t^n dt}{(1-t)^{n+1}} + \int_0^x \frac{t^n dt}{(1+t)^{n+1}}$$

$$\int_0^x t^n dt = \frac{t^{n+1}}{(n+1)} \Big|_0^x = \left[\int_0^x \frac{dt}{(1-t)^{n+1}} + \int_0^x \frac{dt}{(1+t)^{n+1}} \right] - \int_0^x \frac{dt}{(1+t)^{n+1}}$$

which for $n \geq 1$ must be zero.

$$\Phi(t) = e^{-\int_t^\infty f(s) H(s) ds} \quad \Phi_0 = e^{-\int_t^\infty f(s) H_0(s) ds} \quad \Phi = T_0 \Psi(t)$$

$$\text{Hence } \frac{d\Phi}{dt} = H\Phi$$

$$\text{Hence } \frac{dT\Phi}{dt} = (H_0 + H_1) T\Phi$$

$$\text{Hence } \frac{dT\Phi}{dt} + T \frac{d\Phi}{dt} = H_0 T\Phi + H_1 T\Phi$$

$$\frac{dT}{dt} = \frac{1}{e^{\int_t^\infty f(s) H(s) ds}} \int_t^\infty f(s) H(s) ds = \frac{-i \int_t^\infty f'(s) H_0(s) ds}{e^{\int_t^\infty f(s) H(s) ds}} = -\frac{i}{h} \int_t^\infty f'(s) H_0(s) ds$$

$$-\frac{i}{h} \frac{\left[\int_t^\infty f'(s) H_0(s) ds - \int_t^\infty f(s) H_0(s) ds \right]}{e^{\int_t^\infty f(s) H(s) ds}} = -\frac{i}{h} H_0 T$$

$$\text{Hence } \left(-\frac{i}{h} \right) H_0 T\Phi + T \frac{d\Phi}{dt} = H_0 T\Phi + H_1 T\Phi$$

$$\therefore \frac{d\Phi}{dt} = T \left[H_1 - \frac{i}{h} H_0 \right] \Phi = H_1(x_0) \Phi$$

Explicit solution. - a form for the curvilinear function ψ , equation (1), will
need to be chosen, which will enable the flow pattern past a given airfoil at given
free stream Mach number to be calculated explicitly.

$$\begin{aligned}
 & \sum_{\lambda} (-1)^{\ell(\lambda)} \langle \lambda' | \psi_{\lambda} \rangle \langle \lambda' | H_{\alpha} | \psi_{\lambda} \rangle = \langle \psi' | H_{\alpha} | \psi' \rangle - \langle \psi' | H_{\alpha} | \psi'' \rangle \\
 & = \sum_{\lambda} (-1)^{\ell(\lambda)} \langle \lambda' | \psi_{\lambda} \rangle \langle \lambda' | H_{\alpha} | \psi_{\lambda} \rangle + \sum_{\lambda} (-1)^{\ell(\lambda)} \langle \lambda' | \psi_{\lambda} \rangle \langle \lambda' | H_{\alpha} | \psi'' \rangle \\
 & = \sum_{\lambda} (-1)^{\ell(\lambda)} \langle \lambda' | \psi_{\lambda} \rangle \langle \lambda' | H_{\alpha} | \psi'' \rangle
 \end{aligned}$$